
Volume 4: Health and Safety Plan Ruetgers-Nease Salem, Ohio Site

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1.0 INTRODUCTION

This Health and Safety Plan (HSP) describes the procedures that will be followed in conducting field investigation activities at the Ruetgers-Nease Chemical Company (Ruetgers-Nease) Salem, Ohio Site. This section of the HSP describes the purpose of the plan and provides background information on Site conditions.

1.1 Plan Purpose

This HSP is designed to protect the health and safety of personnel involved in the investigation of hazardous substances at the Site and to develop a contingency plan for dealing with on-site emergencies, some of which may have the potential for an off-site impact. Topics addressed in the health and safety program described by this HSP include:

1. Site characteristics
2. Waste characteristics
3. Hazard evaluation
4. Site control
5. Engineering safeguards
6. Personnel training
7. Personnel protection
8. Monitoring equipment

9. Work limitations
10. Action levels
11. Decontamination
12. Medical surveillance
13. Emergency contacts
14. Incident reporting
15. Field documentation of the health and safety procedures
16. Handling of on and off-site generated materials

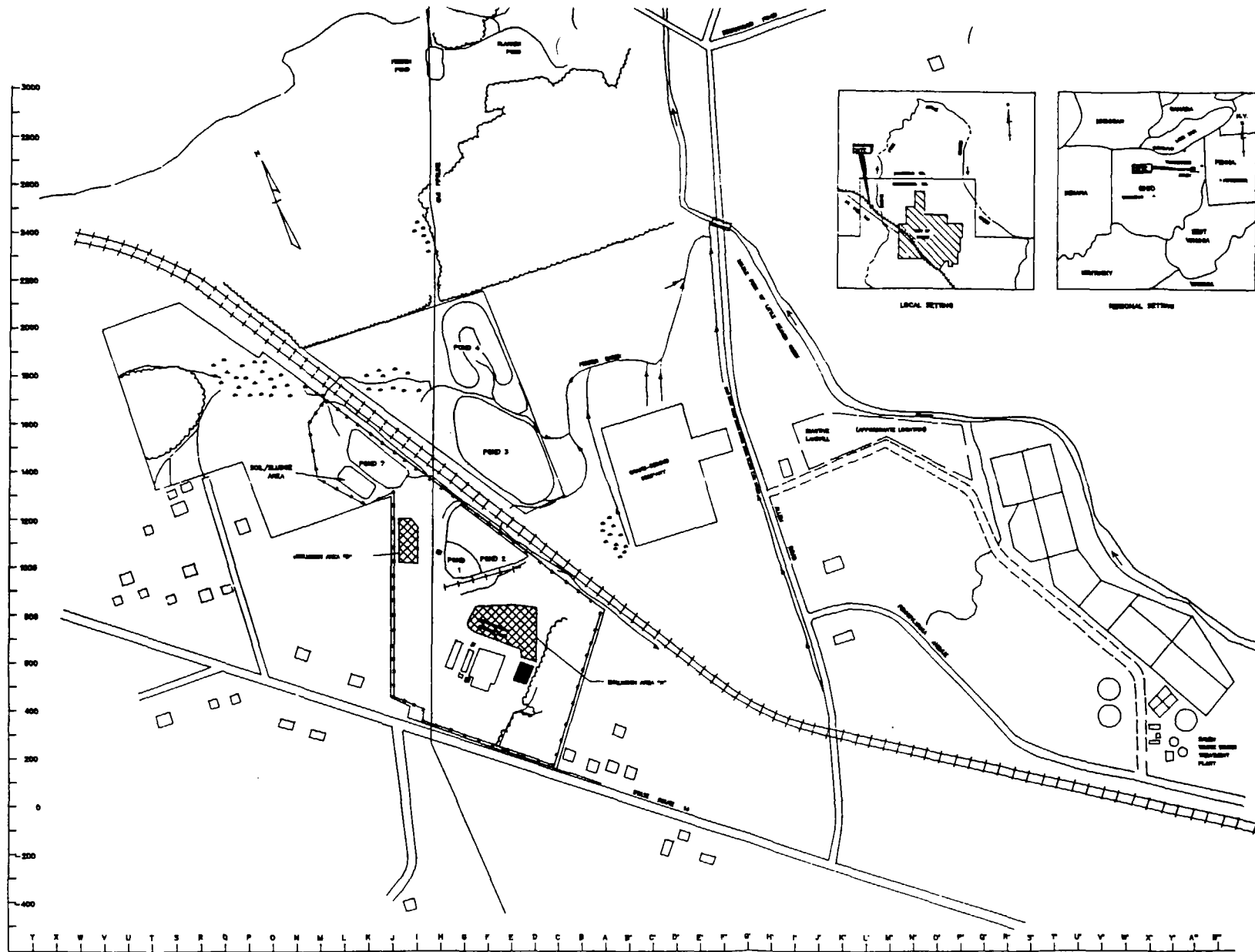
This document describes these program elements as they apply to the activities at the Salem Site.

1.2 Site Background and History

The purpose of providing background information is to educate RI/FS personnel regarding conditions at the Site; the potential risks due to physical, chemical, and toxicological properties of the materials present at the Site; and other types of hazards associated with the investigation such as working with water or heavy equipment.

1.2.1 Location

The Site is located approximately one mile northwest of the City of Salem (see Figure 1-1). Conrail railroad tracks separate the Site into two unequal sections that total



- LEGEND**
- EXISTING ON-SITE BUILDINGS
 - EXISTING ON-SITE BUILDINGS
 - RAILROAD TRACKS
 - PROPERTY FENCE
 - SITE BOUNDARY

FIGURE HSP 1 - 1
 SITE LOCATION MAP
 RAILROAD-HEARSE SALON SITE 12/75
 SCALE
 0 100 200 400 600 (FEET)
 REVISION 10.10

ERM - Midwest, Inc.

approximately 44 acres. The Site is bounded by small light-industrial operations along Allen Road to the east, residences to the immediate southwest, State Route 14A to the south, and wooded areas and pasture lands to the north. Site stormwater drains in a northeasterly direction to the main surface water body in the area, the Middle Fork Little Beaver Creek (MFLBC), which flows northward and then southward to Little Beaver Creek which eventually flows into the Ohio River.

There is an inactive landfill located approximately 1,200 feet east of the Site along the west bank of the MFLBC. This landfill was operated as a dump and extends from the MFLBC to the east side of Allen Road. The area is presently covered with vegetation and construction rubble.

The area's potable water supply is provided by both a public water system and private wells. The small businesses along Allen Road receive drinking water from the City of Salem, although Dunlap Disposal uses well water for non-potable purposes. Residents along State Route 14A and further north on Allen Road and Goshen Road use either public water or private wells. The City of Salem has a reservoir which draws water from Cold Run Creek, approximately seven miles south of the Site. Cold Run Creek is in a different watershed than is the Site.

The area is underlain by glacial deposits of the Kent Moraine, a five to fifteen mile wide belt of nonhomogeneous glacial drift. Approximately 10 to 25 feet of drift underlies the Site (Figure 1-2). This drift consists mostly of silty or sandy, gray-blue, plastic clay with some pebbles and boulders. Sand and gravel deposits within the drift have permeabilities higher than that of the silty or sandy clays. The drift is underlain by sedimentary rocks consisting mainly of interbedded sandstones, shales and coal seams.

HSP-5

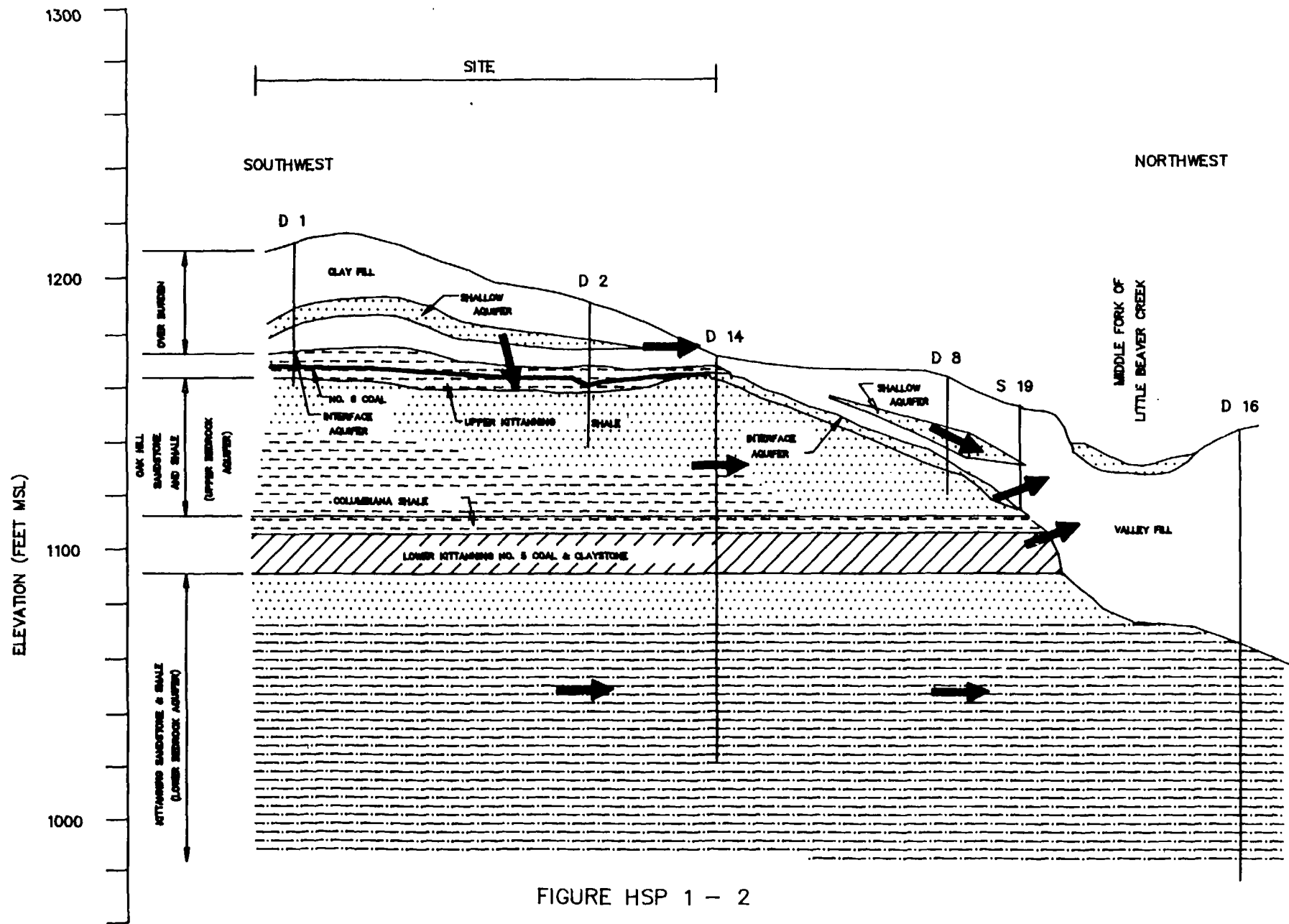


FIGURE HSP 1 - 2
STRATIGRAPHIC AND HYDROGEOLOGIC
CROSS SECTION

REUTERS-NEASE SALEM SITE RI/FS

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Prior to drift deposition, glacial forces eroded a valley into the sedimentary rocks east of the Site. This eroded valley was filled as glacial drift was deposited.

The distinct aquifers within the study area have been named the Shallow, Interface, Upper Bedrock, Lower Bedrock and Valley Fill. Both confined and unconfined conditions are found in the area. Ground water beneath the Site is apparently moving toward the MFLBC. Hydrogeologic conditions near the MFLBC and within the Valley Fill have not been fully delineated.

1.2.2 History

From 1961 until 1973, Nease Chemical Company produced chemicals such as household cleaning compounds, pesticides, fire retardants, and chemical intermediates at the Site. Products and chemical intermediates were produced in batch processes.

Nease's waste handling facilities included air scrubbers and a multiple pond/settling tank system for neutralization and treatment of acidic waste. Five unlined lagoons (1, 2, 3, 4, and 7) were used for treatment and storage of either acidic waste or lime slurries from waste neutralization. In 1969, a pipeline was constructed to carry neutralized wastewater to the Salem Wastewater Treatment Plant. Some 55-gallon drums containing wastes were buried on-site in Exclusion Area A.

Following notification from OEPA of wastewater violations, Nease Chemical Company agreed in a Consent Judgment in 1973, to discontinue manufacturing operations at the Site until such time as a new wastewater permit was obtained. Instead, Nease decided to close the facility. Pond water was neutralized and removed to the Salem

Wastewater Treatment Plant. Nease also filled/graded several ponds, and removed all production facilities with the exception of a warehouse and two small block buildings. On December 30, 1977, Nease merged with Ruetgers Chemicals, Inc. to form Ruetgers-Nease Chemical Company, Inc.

1.2.3 Existing Conditions

Currently, the Site contains a single-story warehouse; two small concrete-block buildings; concrete pads, foundations, and tile floors remaining from the manufacturing facilities; concrete tank saddles; and the pond areas. The Site west of the Conrail tracks is surrounded by a fence with access from Route 14. Much of the Site has been revegetated by weeds and grasses.

The banks of Pond 1 slope steeply to the water surface, which is about eight to ten feet below grade. The surface of Pond 2 contains isolated patches of grasses and weeds surrounded by barren areas. The surfaces of Ponds 3, 4 and 7 consist of weeds, grasses, small shrubs and some small trees. A soil/sludge pile west of Pond 7 is covered by weeds, grasses, shrubs and small trees, and is approximately five to eight feet above grade. The surfaces of Ponds 3 and 7 may not support heavy equipment.

The remainder of the study area contains large fields, stands of trees, plowed fields, houses and buildings. The Crane-Deming swamp contains areas of bare soils, and wetland grasses. Trees and dense vegetation border the MFLBC.

1.3 Problem Statement

Previous studies have identified sources on-site and have indicated that contaminant migration off-site may be

occurring. The RI approach has been developed, in part, to identify all sources, characterize contaminants, and determine the limits of contaminant migration. A description of known sources, affected media, and the rationale for sampling are provided in the following sections.

1.3.1 Sources

Potential sources of contamination at the Site are listed in Table 1-1. The actual contribution of sources to affected media have not been qualified and quantified. The complete set of contaminants migrating from these sources has not been qualified or quantified by samples meeting USEPA QA/QC guidelines.

1.3.2 Affected Media

Previous studies have identified contaminants in various media. Media affected or potentially affected are listed on Table 1-2.

1.3.3 Sampling Rationale

Sample locations and analyses have been identified that will provide data necessary to meet the objectives of the RI/FS and to complete activities. Sample types, locations, collection methods, and sampling objectives are listed on Table 1-3. Scheduled analyses are listed on Table 1-4. Samples considered critical to achieving project objectives, and a summary of activities to ensure these samples meet QA/QC criteria are listed on Table 1-5

Target Compound List (TCL) analysis will be conducted using Contract Laboratory Program (CLP) procedures. Methods will be developed and validated for mirex, kepone, photomirex, DCNB, and DPS, which are not on the TCL. Methods

HSP TABLE 1-1

POTENTIAL CONTAMINANT SOURCES⁽¹⁾
RUETGERS-NEASE SALEM SITE RI/FS

<u>Source</u>	<u>Characterization</u>
Exclusion Areas A and B	Some buried drums and contaminated soils (removed) contained volatile and non-volatile organics.
Pond 1, 2	Disposal of treated process waters containing volatile organic compounds in non-secure/unlined areas (some Pond 1 soil removed).
Ponds 3,4,7,	Contaminants, if present in soil/sludge stockpile neutralized calcium sulfate sludge, may migrate through unlined pond bottoms or in surface runoff.
Manufacturing areas, on-site surface and subsurface soils	Possible chemical spills may have contaminated soils.

(1) Based on sampling by Ruetgers-Nease performed to date. Confirming and characterizing sources is an objective of the RI.

HSP TABLE 1-2

AFFECTED OR POTENTIALLY AFFECTED MEDIA
RUETGERS-NEASE SALEM RI/FS

<u>Media</u>	<u>Location</u>	<u>Potential Contaminants</u>
Surface Water	Feeder Creek ⁽¹⁾	Volatile Organics Non-Volatile Organics Additional Organics
	MFLBC ⁽¹⁾	Volatile Organics Non-Volatile Organics Additional Organics
Sediments	Feeder Creek ⁽¹⁾	Volatile Organics Non-Volatile Organics Additional Organics
	MFLBC ⁽¹⁾	Volatile Organics Non-Volatile Organics Additional Organics
	Slanker Pond ⁽¹⁾	Non-Volatile Organics Additional Organics
	Crane-Deming ⁽¹⁾ Swamp	Volatile Organics Non-Volatile Organics Additional Organics
Fish	MFLBC ⁽²⁾	Non-Volatile Organics Additional Organics
Soils	On-Site ⁽¹⁾	Volatile Organics Non-Volatile Organics Additional Organics
Sludges	Salem Wastewater Treatment Plant Sludge Cells 4, 6 and 8 ⁽²⁾	Volatile Organics Non-Volatile Organics Additional Organics

(1) Based on sampling by Ruetgers-Nease performed to date.

(2) Ruetgers-Nease has not sampled these locations.

(3) This aquifer may, or may not exist down gradient of the site.

*Non-Volatile Organics are defined here and throughout the document as TCL BNA +25, TCL pesticides/PCBs

HSP TABLE 1-2 (Cont'd)

AFFECTED OR POTENTIALLY AFFECTED MEDIA
RUETGERS-NEASE SALEM RI/FS

<u>Media</u>	<u>Location</u>	<u>Potential Contaminants</u>
Ground Water	Shallow ⁽¹⁾ Aquifer	Volatile Organics Non-Volatile Organics Additional Organics
	Interface ⁽¹⁾ Aquifer	Volatile Organics Non-Volatile Organics Additional Organics
	Upper Bedrock ⁽¹⁾ Aquifer	Volatile Organics Non-Volatile Organics Additional Organics
	Lower Bedrock ⁽¹⁾ Aquifer	Volatile Organics Non-Volatile Organics Additional Organics
	Valley Fill ⁽²⁾⁽³⁾ Aquifer	Volatile Organics Non-Volatile Organics Additional Organics

(1) Based on sampling by Ruetgers-Nease performed to date.

(2) Ruetgers-Nease has not sampled these locations.

(3) This aquifer may, or may not exist down gradient of the site.

*Non-Volatile Organics are defined here and throughout the document as TCL BNA +25, TCL pesticides/PCBs

HSP TABLE 1-3

SAMPLING RATIONALE
RUETGERS-NEASE SALEM SITE RI/FS

<u>Information Needed</u>	<u>Rationale</u>	<u>Data Gathering Methods</u>
1. Characteristics of on-site surface and subsurface soils.	1. On site soil contaminant distribution - horizontal and vertical 2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/ technology screening, and detailed alternative evaluation completed during the Feasibility Study.	Test pits, analysis of samples from side walls of pits and backhoe bucket
2. Characteristics of off-site surface and subsurface soils in the Crane-Deming Swamp.	1. Contaminant distribution in the Crane-Deming Swamp - horizontal and vertical 2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/ technology screening, and detailed alternative evaluation completed during the Feasibility Study.	Test pits, analysis of samples from side walls of pits and backhoe bucket

HSP TABLE 1-3 (cont'd)

SAMPLING RATIONALE
RUETGERS-NEASE SALEM SITE RI/FS

<u>Information Needed</u>	<u>Rationale</u>	<u>Data Gathering Methods</u>
3. Characteristics of on-site Non-native Pond materials.	<ol style="list-style-type: none"> 1. Pond contaminant distribution - vertical and horizontal 2. Non-native material physical characterization 3. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 4. Support the identification, development, and evaluation of remedial alternatives/ technology screening, and detailed alternative evaluation completed during the Feasibility Study. 	Soil borings, sampling and analysis of split spoon and shelby tube samples
4. Characteristics of Native Pond materials (soils under the pond bottom).	<ol style="list-style-type: none"> 1. Pond contaminant distribution - vertical horizontal 2. Native material physical characterization 3. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 	Soil borings, sampling and analysis of split spoon and shelby tube samples

HSP TABLE 1-3 (cont'd)

SAMPLING RATIONALE
RUETGERS-NEASE SALEM SITE RI/FS

<u>Information Needed</u>	<u>Rationale</u>	<u>Data Gathering Methods</u>
	4. Support the identification, development, and evaluation of remedial alternatives/technology, and detailed alternative evaluation completed during the Feasibility Study.	
5. Characteristics of off-site surface and subsurface soils.	1. Off-site soil contaminant distribution 2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/technology screening, and detailed alternative evaluation completed during the Feasibility Study.	Soil borings, sampling and analysis of split spoon or auger samples
6. Characteristics of on and off-site sediments.	1. Sediment contaminant distribution - horizontal - within the drainage ways, Feeder Creek, Slanker Pond and MFLBC	Collection and analysis of location specific surface sediments

HSP TABLE 1-3 (cont'd)

SAMPLING RATIONALE
RUETGERS-NEASE SALEM SITE RI/FS

<u>Information Needed</u>	<u>Rationale</u>	<u>Data Gathering Methods</u>
	2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/technology screening, and detailed alternative evaluation completed during the Feasibility Study.	
7. Characteristics of on and off-site surface water bodies	1. Contaminant distribution - horizontal - within the drainage ways, Feeder Creek, Slanker Pond and MFLBC 2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/technology screening, and detailed alternative evaluation completed during the Feasibility Study.	Collection and analysis of location specific surface water samples

HSP TABLE 1-3 (cont'd)

SAMPLING RATIONALE
RUETGERS-NEASE SALEM SITE RI/FS

<u>Information Needed</u>	<u>Rationale</u>	<u>Data Gathering Methods</u>
8. Characteristics of on and off-site ground water	<ol style="list-style-type: none"> 1. Contaminant distribution - horizontal and vertical aquifers 2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/technology screening, and detailed alternative evaluation completed during the Feasibility Study. 	Sampling and analysis of monitoring and residential wells
9. Air monitoring station upwind and downwind of the site	<ol style="list-style-type: none"> 1. Define areal extent of contaminant concentrations 2. Determine contaminant concentrations, migration pathways and routes of entry in order to complete an Endangerment Assessment 3. Support the identification, development, and evaluation of remedial alternatives/technology screening, and detailed alternative evaluation completed during the Feasibility Study. 	Sampling and analysis of 6 stations

HSP TABLE 1-3 (cont'd)

SAMPLING RATIONALE
RUETGERS-NEASE SALEM SITE RI/FS

<u>Information Needed</u>	<u>Rationale</u>	<u>Data Gathering Methods</u>
10. Mapping and surveying	1. Locate existing structures and obstructions for alternatives evaluation, site features, and topography description	Site survey, site inspections, existing and updated facility maps

HSP Table 1-4
RI Sampling Summary¹
Rutgers-Nease Salem Site RI/FS

<u>Media</u>	<u>Location</u>	<u>Sample Type</u>	<u>Collective Analysis</u>
Ground water Round 1	Monitoring and residential wells (68 locations)	Bailed/pumped	TCL Organics +40 ² ; SAS1 ³
	Monitoring wells (S6, S12, S18, T2)	Bailed/pumped	TCL Organics +40; SAS1; SAS2 ⁴ ; TCL inorganics
Round 2	Monitoring wells (TBD) ⁵	Bailed/pumped	To be determined
Soil	On-site, Crane-Deming (24 locations)	Test pit, depth specific	TCL Organics +40; SAS1
	Exclusion Area A & B + 4 additional sites (6 locations)	Test pit, depth specific	TCL Organics +40; SAS1; SAS2; TCL Inorganics
	Railroad tracks (TBD) ⁵	Test pit, depth specific	TCL Organics +40; SAS1
	5 ponds, soil/sludge area (14 borings)	Split spoon, depth specific (non-native)	TCL Organics +40; SAS1, SAS2; TCL Inorganics
		Split spoon, depth specific (native)	TCL Organics + 15; SAS1; Methoxychlor
		Split spoon, depth specific composite (native)	TCL Non-Volatile Organics + 25
		Shelby Tube (3 feet) depth specific	Physical characteristics
	Floodplains (7 locations)	Composite	TCL Non-Volatile Organics +25; SAS1
	Off-site soils (11 borings)	Split spoon	TCL Non-Volatile Organics + 25; SAS1
	Off-site soil/sludge (3 locations)	Split spoon	TCL Organics +40; SAS1
Sediment	Slanker Pond (4 locations)	Pond bottom, beach, inlet/outlet	TCL Organics +40; SAS1
	MFLBC (50 locations)	Composite (1 foot)	TCL Organics +40; SAS1
	Feeder Creek (3 locations)	Composite (1 foot)	TCL Organics +40; SAS1
	On-site drainage and Crane-Deming (4 locations)	Grab	TCL Organics +40; SAS1
Surface Water	Slanker Pond (1 location)	Grab	TCL Organics +40; SAS1
	MFLBC (21 locations)	Grab	TCL Organics +40; SAS1
	Feeder Creek (3 locations) if water present	Grab	TCL Organics +40; SAS1
	Crane-Deming (1 location)	Grab	TCL Organics +40; SAS1
Fish	Slanker Pond (1 location)		TCL Organics +40; SAS1
	MFLBC (27 locations)		TCL Organics +40; SAS1
Air	On-site, upwind downwind (6 locations)	24 hour	TCL Organics +40 ⁶ ; SAS1

¹Based on one sampling event

²Target compounds list plus library searches

³SAS1 = Mirex, photomirex, kepone, DPS

⁴SAS2 = 3,4-DCNB, dioxins and furans

⁵To be determined

⁶Four of the ketones on the VOA TCL will not be examined.

HSP TABLE 1-5

CRITICAL SAMPLE SUMMARY
RUETGERS-NEASE SALEM SITE RI/FS

Sample Location	Matrix	Rationale	Activity
Well Cluster "J"	Ground Water	1) Determine existing background water quality at the site. 2) Provide basis for remediation levels.	1) Collect collocated sample from one well. 2) Complete two sample events. 3) 100% ⁽¹⁾ completeness goal. 4) SAS low detection levels. (See Section 9)
Residential Wells	Ground Water	1) Ensure acceptable drinking water quality.	1) Collect two collocated samples during each sampling event. 2) 100% ⁽¹⁾ completeness goal. 3) SAS low detection levels. (See Section 9)
MFLBC 1	Surface Water	1) Define background water quality conditions in MFLBC.	1) Collect one collocated sample at the upgradient location. 2) 100% ⁽¹⁾ completeness goal 3) SAS low detection levels. (See Section 9)
Off-Site Soil (background)	Soil	1) Define natural or background soil conditions. 2) Provide remedial design Data	1) One collocated sample from one boring. 2) 100% ⁽¹⁾ completeness goal.
MFLBC 1	Fish	1) Define background conditions	1) 100% ⁽¹⁾ completeness goal.
Slanker Pond	Surface Water	1) Ensure acceptable water quality	1) 100% ⁽¹⁾ completeness goal.

(1) Data with <100% completeness will be acceptable as long as the deficiency does not hinder project objectives.

development and validation study design and its completion will both be submitted for U.S. EPA and OEPA approval before investigation activities begin.

2.0 SCOPE AND LIMITATIONS

This HSP establishes responsibilities and procedures for the health and safety program to be followed during the remedial investigation at the Ruetgers-Nease Site in Salem, Ohio. This plan has been designed to satisfy the OSHA requirements specified in 29 CFR-1910.120.

Every potential safety hazard associated with this investigation cannot be predicted. This HSP does not attempt to establish rules to cover every contingency which may arise, but is intended to provide a basic framework for the safe completion of field activities planning for reasonable contingencies. The procedures provided herein are to be used by all contractor and subcontractor employees who will be involved in the performance of the project. All personnel are required to enforce and adhere to the established rules specified in the approved HSP which will be made available to them.

On-site subcontractors shall adopt this HSP, and shall complete all work in accordance with the plan.

3.0 ORGANIZATION AND RESPONSIBILITIES

The organization and responsibilities for implementing this HSP are described in this section. Safety responsibilities must be incorporated into project management roles to ensure proper program implementation. Additionally, all persons participating in this investigation must be aware of the potential hazards involved and assume appropriate responsibilities to protect themselves and others. A well-defined organizational structure is an important factor for instilling a strong safety ethic into remedial investigations. Figure 3-1 illustrates the organizational structure for this project. Responsibilities as they impact health and safety are described below. Other responsibilities of the project team are described in the other volumes of the Work Plan. This plan may be amended only with the approval of the U.S. EPA and OEPA.

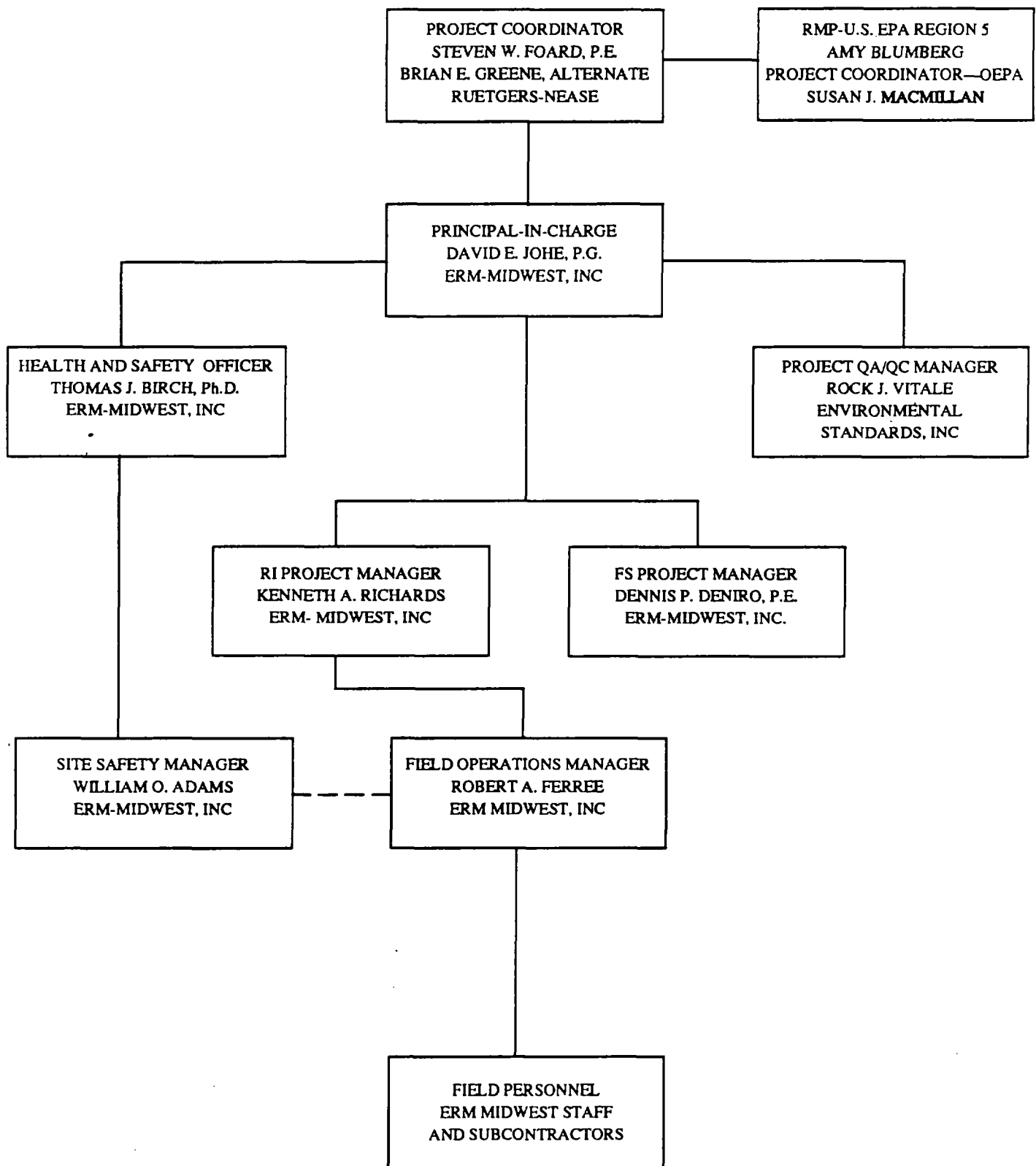
3.1 U.S. EPA RPM and OEPA Project Coordinator

Amy Blumberg is U.S. EPA's Region 5 Remedial Project Manager and Susan MacMillan is OEPA's Project Coordinator for this RI/FS. Their responsibilities include:

1. Technical review and approval of all plans and data submitted as part of the RI/FS.
2. Coordination of RI/FS activities with the Project Coordinator.
3. Overseeing and approving amendments to the HSP.

FIGURE HSP 3-1

**HEALTH AND SAFETY ORGANIZATION
RUETGERS-NEASE SALEM SITE RI/FS**



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3.2 Project Coordinator

Steven W. Foard, P.E., of Ruetgers-Nease is the Project Coordinator for this investigation. The Project Coordinator is responsible for recommending and requesting modifications to this HSP for approval by both U.S. EPA and OEPA. Brian E. Greene of Ruetgers-Nease is the Alternate Project Coordinator.

3.3 Principal-in-Charge

The Principal-in-Charge (PIC) for the project is David E. Johe, of ERM-Midwest. The PIC is responsible for providing the ERM-Midwest resources necessary to implement the provisions of this HSP and to enforce the ERM-Midwest commitment to health and safety.

3.4 Project Manager

The RI Project Manager is Kenneth A. Richards, of ERM-Midwest. The RI Project Manager is responsible for coordinating field activities so that project objectives are met without compromising health and safety. This responsibility includes identifying the resources necessary to complete project activities in accordance with the provisions of the HSP and other project plans.

3.5 Field Operations Manager

The Field Operations Manager will be Robert A. Ferree of ERM-Midwest or designated alternate. He will be responsible for the overall implementation and monitoring of the HSP by:

1. Assuring that personnel are aware of the provisions of the HSP.
2. Assuring that appropriate personnel-protective equipment is available and properly used by all personnel.
3. Assuring that personnel are aware of potential hazards associated with the project.
4. Correcting any work practices that may result in injury or exposure to hazardous substances.
5. Maintaining communications with the Health and Safety Officer and Site Safety Manager.
6. Conducting daily safety briefings.
7. Assisting Site Safety Manager with ambient air monitoring.

3.6 ERM-Midwest Project Health and Safety Officer

ERM-Midwest's Health and Safety Officer is Thomas J. Birch, Ph.D. He is responsible for the overall coordination of safety matters at ERM-Midwest. His responsibilities include arranging safety training programs, evaluating new procedures, providing a follow-up investigation on corrective actions, and generally monitoring the hazardous waste site investigation safety program. He also is responsible for ensuring that proper safety equipment and clothing are available and in working order, and providing a liaison to field teams at the Site.

He will coordinate the health and safety program at the Site and will be responsible for the following:

1. Advising on health and safety policy issues.
2. Providing guidance on operational and logistical options.
3. Ensuring that health and safety training programs are available and that all personnel have received required training.
4. Monitoring the effectiveness of the HSP through review of field operation audits conducted by the Site Safety Manager.
5. Following up on necessary corrective actions.
6. Recommending the stoppage of work should Site conditions warrant such action.
7. Ensuring and verifying that all employees at the work site are being monitored under appropriate medical surveillance, hearing conservation, and respiratory protection programs.
8. Recommending proper and necessary precautions to take or work limitations required to reduce heat or cold stress.

3.7 Site Safety Manager

The Site Safety Manager (SSM) or designee for the project will be William O. Adams of ERM-Midwest. The SSM is responsible for the safety of field personnel at the Site.

This responsibility includes determining hazards associated with individual investigation phases, assisting the Project and Field Operations Managers in developing this HSP, reviewing safety matters during field operations, and notifying the Site Manager of any unsafe conditions or practices. The SSM will be responsible for the following:

1. Ambient air monitoring.
2. Assuring that all personal protection equipment and clothing are available and in proper working order at the Site.
3. Completing project safety briefings and reports.
4. Ensuring Health and Safety program compliance by conducting field audits.
5. Investigating accidents, implementing appropriate corrective actions, and preparing accident/incident reports.
6. Supervising and monitoring the safety performance of all personnel by conducting field audits to ensure that the required work practices are employed.
7. Verify that all personnel have received required health and safety training.

The SSM works with the Field Operations Manager to coordinate activities such that project objectives are met without compromising health and safety. On matters of health and safety, the SSM reports to the ERM-Midwest Project Health and Safety Officer.

3.8 Field Personnel

All field personnel will report directly to the Field Operations Manager and will be required to:

1. Be familiar with, and conform to, provisions of the HSP and complete the Health and Safety Plan Acceptance Form (Appendix B) prior to work in the work exclusion area at the Site.
2. Report accidents and/or hazardous conditions to the Field Operations Manager and the Site Safety Manager.
3. Have complete familiarity with their job requirements and the health and safety procedures involved.

All field personnel will be trained according to the OSHA standards set forth in 29 CFR 1910.120, and should be able to identify potential hazards if they arise.

4.0 SITE HAZARD EVALUATION

The purpose of the Hazard Evaluation is to determine the hazards that exist or potentially exist at the Site and to specify levels of protection and site boundaries necessary to limit risks to the local population, site workers, and the environment.

4.1 Health Effects

The possible presence of volatile organic and non-volatile organic compounds (Table 4-1) is the major health concern posed by the Site. Compounds possibly present include known or suspected carcinogens, mutagens, teratogens, and poisons. Protecting people from exposure to these substances by inhalation, oral ingestion, or dermal absorption is one of the primary purposes of this plan.

The potential inhalation and explosive hazards are shown in Table 4-1. Also shown in Table 4-1 are the OSHA Permissible Exposure Limit (PEL), threshold limit values (TLV) for the Time Weighted Average (TWA) and the Short-Term Exposure Limit (STEL), the Immediately Dangerous to Life or Health (IDLH) level, the Lower Explosive Limit (LEL), and the Upper Explosive Limit (UEL), for the possible volatile organic hazards. Symptoms of overexposure, possible chronic effects, and first aid treatment for the compounds found at the Site are provided in Appendix A.

The Project Health and Safety Officer and the Site Safety Manager are responsible for determining the level of personal protection equipment required using FID and PID instrumentation to compare to pre-established levels of protection. When work-site conditions warrant, the Site

TABLE HSP 4-1

HEALTH AND SAFETY LIMITS FOR POSSIBLE HAZARDOUS COMPOUNDS
RUETGERS-NEASE SALEM SITE R1/FS

VOLATILE ORGANIC COMPOUNDS

<u>Compounds</u>	<u>OSHA PEL(2)</u>	<u>TLV(1)</u>		<u>IDLH(5)</u>	<u>LEL(6)</u>	<u>UEL(7)</u>	<u>Incompatibles</u>
		<u>TWA(3)</u>	<u>STEL(4)</u>				
1,1-Dichloroethane 75-34-3	100 ppm	200 ppm	250 ppm	4,000 ppm	6%	16%	Strong oxidizers and caustics
1,2-Dichloroethene	200 ppm	200 ppm	NA	4,000 ppm	9.7%	12.8%	Strong oxidizers and caustics
Chloroform 67-66-3	50 ppm (ceiling)	10 ppm	NA	1,000 ppm	NC	NC	Strong caustics, chemically active metals such as aluminum, magnesium, sodium, potassium
1,2-Dichloroethane 107-06-2	50 ppm	10 ppm	NA	1,000 ppm	6.2%	16%	Strong oxidizers, strong caustics, chemically active metals such as aluminum, magnesium, sodium, potassium
1,1,1-Trichloroethane 71-55-6	350 ppm	350 ppm	450 ppm	500 ppm	7%	16%	Acids
1,2 Dichloropropane Method 1013 78-87-5	75 ppm	75 ppm	110 ppm	2,000 ppm	3.4%	14.5%	Incompatible with strong oxidizers and acid
* 1,3 Dichloropropene (skin) 542-75-6 10061-01-5	NA	1 ppm	NA	NA	NA	NA	

TABLE HSP 4-1 (cont'd)

HEALTH AND SAFETY LIMITS FOR POSSIBLE HAZARDOUS COMPOUNDS
RUETGERS-NEASE SALEM SITE RI/FS

VOLATILE ORGANIC COMPOUNDS

<u>Compounds</u>	<u>OSHA PEL(2)</u>	<u>TLV(1)</u>		<u>IDLH(5)</u>	<u>LEL(6)</u>	<u>UEL(7)</u>	<u>Incompatibles</u>
		<u>TWA(3)</u>	<u>STEL(4)</u>				
Trichloroethylene 79-01-6	100 ppm 200 ppm (c)	50 ppm	200 ppm	1,000 ppm	11%	41%	Strong caustics, chemically active metals such as aluminum, barium, lithium, sodium, magnesium, titanium
Benzene 71-43-2	1 ppm 25 ppm (c) 50 ppm (stel)	10 ppm	NA	2,000 ppm	1.3%	7.1%	Strong oxidizers, chlorine, bromine with iron
* 1,1,2,2 Tetra- chloroethene	100 ppm	50 ppm	200 ppm	500 ppm	NC(8)	NC(8)	Chemically active metals such as barium, lithium, beryllium; strong oxidizers
1,1,2,2 Tetrachloroethane (skin) 79-34-5	5 ppm	1 ppm	NA	150 ppm	NC(8)	NC(8)	Chemically active metals, strong caustics; hot iron, aluminum, zinc in presence of steam
Toluene 108-88-3	200 ppm	100 ppm	150 ppm	2,000 ppm	1.3%	7.1%	Strong oxidizers
Chlorobenzene 108-90-7	75 ppm	75 ppm	NA	2,400 ppm	1.3%	7.1%	Strong oxidizers
Ethyl benzene 100-41-4	100 ppm	100 ppm	125 ppm	2,000 ppm	1.0%	6.7%	Strong oxidizers

TABLE HSP 4-1 (cont'd)

HEALTH AND SAFETY LIMITS FOR POSSIBLE HAZARDOUS COMPOUNDS
RUETGERS-NEASE SALEM SITE R1/FS

VOLATILE ORGANIC COMPOUNDS

<u>Compounds</u>	<u>OSHA PEL(2)</u>	<u>TLV(1)</u>		<u>IDLH(5)</u>	<u>LEL(6)</u>	<u>UEL(7)</u>	<u>Incompatibles</u>
		<u>TWA(3)</u>	<u>STEL(4)</u>				
o,m,p - xylene	100 ppm	100 ppm	150 ppm	10,000 ppm	1.1%	7.0%	Strong oxidizers
o - Dichlorobenzene 95-50-1	50 ppm(c)	50 ppm	NA	1,700 ppm	2.2%	9.2%	Strong oxidizers, not aluminum or aluminum alloys
m,p - Dichlorobenzene 106-46-7	75 ppm	75 ppm	110 ppm	1,000 ppm	2.5%	unknown	none

NON-VOLATILE ORGANIC COMPOUNDS

Methoxchlor	15 mg/m3	10 mg/m3	NA	7,500 mg/m3	NA	NA	Strong oxidizers
Mirex	NA	NA	NA	NA	NA	NA	Acids
3,4 Dichloronitro- benzene	NA	NA	NA	NA	NA	NA	Oxidizers, aluminum, liquid oxygen, potassium, sodium
Diphenyl sulfone DPS	NA	NA	NA	NA	NA	NA	NA

TABLE HSP 4-1 (cont'd)

HEALTH AND SAFETY LIMITS FOR POSSIBLE HAZARDOUS COMPOUNDS
RUETGERS-NEASE SALEM SITE R1/FS

VOLATILE ORGANIC COMPOUNDS

FOOTNOTES:

1. Threshold Limit Value.
2. Permissible exposure limit (from NIOSH/OSHA).
3. Time weighted average (from ACGIH).
4. Short term exposure limit (from ACGIH).
5. Immediately dangerous to life or health (from NIOSH/OSHA).
6. Lower explosive limit, in air (from NIOSH/OSHA).
7. Upper explosive limit, in air (from NIOSH/OSHA).
8. If temperatures are hot enough, compound will breakdown into new hazardous substances.

NA = Not available

NC = Noncombustible

* = Values based on a value for similarly structured compound.

Sources: NIOSH Pocket Guide to Chemical Hazards 1985

ACHIH, 6500 Glenway Avenue, Bldg. D-7, Cincinnati, OH 45211-4438

Rapid Guide to Hazardous Chemicals in the Workplace, Irving A and Richard J. Lewis, Sr.

Von Nostrand Reinhold Company, NY 1986

Dangerous Properties of Industrial Materials, Von Nostrand Reinhold Company, NY 1984

OSHA Region III Office, Philadelphia, PA 1987, Ms. Jones, I.H.

Safety Manager will modify the level of protection to be utilized in the field after consulting with the Project Health and Safety Officer and/or the Field Operations Manager and receiving U.S. EPA/OEPA approval. The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the suspension of work until the Health and Safety Officer, Site Safety Manager and/or the Project Manager has been notified and appropriate instructions have been provided to the SSM or Field Operations Manager.

5.0 PERSONNEL PROTECTION AND HEALTH AND SAFETY GUIDANCE FOR SPECIFIC TASKS

Personnel protection and procedures for specific tasks to be conducted during this study are discussed in this section.

All personnel must wear appropriate protective equipment and follow standard operating procedures during field investigations. Protective clothing shields the skin from contact with hazardous chemicals, respirators protect the lungs and respiratory system (and eyes, when full-face respirators are worn), safety eye glasses/goggles protect the eyes, and good personal hygiene limits or prevents ingestion/absorption or inhalation of foreign materials. Standard operating procedures minimize the potential for accident and/or injury.

Levels of protection for specific field activities will be reviewed throughout this project. The levels of protection contained herein are to be considered requirements based upon FID and/or PID readings. At the Site, air quality monitoring will be conducted and will be used as supportive information in the establishment of appropriate levels of personnel protection.

5.1 Standard Operating Procedures

During this investigation, all personnel must adhere to the following rules:

1. During Site operations, the buddy system must be used to allow workers to act as safety backups to each other. Hand signals will be established prior

to the commencement of field activities. Off-site personnel are to provide emergency assistance.

2. All personnel should be aware of the dangerous situations which may develop because of the physical constraints imposed by personal protection equipment.
3. Visual or two way radio contact must be maintained between groups on-site or off-site.
4. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the exclusion and contaminant reduction zones.
5. Medicine and alcohol can increase the effects from exposure to toxic chemicals. Prescription drugs should not be taken by personnel where the potential for contact with toxic substances exists, unless specifically approved by a qualified physician. Alcohol intake is prohibited during the work shift.
6. Facial hair (including beards and long sideburns) which interferes with the respirator to face seal is not allowed on personnel required to wear or potentially wear respiratory protection equipment. Each staff member must pass a qualitative or quantitative fit test for respirators.
7. Contact lenses will not be permitted at the Site. If glasses are required, prescription or "plano" safety glasses meeting the requirements of ANSI Z87.1-1979 standards must be worn. Employees will

be fitted with spectacle kits for use with full-face respirators when necessary.

8. Disposable clothing will be used whenever possible to minimize the risk of contamination and disposed of as noted in Section 9 of this HSP.
9. Procedures for leaving any contaminated area will be planned and implemented prior to going on-site. Exclusion areas, contamination reduction areas, and decontamination procedures will be established (see Section 9.0).
10. Contact with contaminated or potentially-contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, mud, or any discolored ground surface; do not kneel on the ground, lean, sit or place equipment on drums, containers, vehicles or on the ground.
11. Air monitoring will be conducted on an on-going basis. Ambient air quality can change rapidly during subsurface excavations.
12. No personnel will be admitted to the exclusion and contamination reduction areas without the proper safety equipment, OSHA training and medical clearance.
13. Proper decontamination procedures must be followed before leaving the Site (see Section 7.0).
14. All personnel must comply with established safety procedures. Any person who does not comply with the established safety policy will be immediately dismissed from the Site.

15. Any medical emergency supersedes routine safety requirements (see Section 10).

5.2 Protective Equipment Selection and Limitation

At this time, conditions mandating Level A or B protection are not anticipated at the Site. Should such conditions arise, the immediate work area will be evacuated and the situation reviewed.

5.2.1 Level A

If VOC concentrations pose significant (IDLH or serious acute risks) health hazards and all alternatives exhausted as determined by the Project Health and Safety Officer and Project Manager, an upgrade to Level A protective equipment will be necessary. This upgrade is not anticipated and will only be used as a last resort when all other means have been exhausted. Upgrading to Level A will only be necessary when full encapsulation of the individual is required.

5.2.1.1 Protective Equipment

1. Full Face pressure-demand SCBA
2. Fully-encapsulated chemical resistant suit
3. Inner chemical-resistant gloves
4. Two way radio communication
5. Cooling/heating unit (if appropriate)
6. Coveralls

7. Long cotton underwear (if appropriate)
8. Hard hat
9. Steel-toed shoes
10. Disposable gloves and boot covers

5.2.1.2 Selection Criteria

Level A contaminant concentrations that warrant the need for total encapsulation as determined by the Project Health and Safety Officer and Site Safety Manager.

5.2.2 Level B

If VOC concentrations are greater than 20 ppm as detected by FID and/or PID instruments, Level B personal protective equipment will be required. Based on previous site investigations, Level B protection is not anticipated during remedial investigation activities.

A 20 ppm level is established based upon:

1. Chemical odor thresholds
2. Breakthrough characteristics associated with chemical absorption and penetration through an organic vapor cartridge.
3. Full face piece protection factor of 50X
4. A random 50% safety factor or margin due to unknown synergists effects of the potential chemicals identified in the sludge.

Twenty parts per million (20 ppm) is well below the OSHA and ACGIH established STEL and IDLH values for the chemicals listed in Table 4-1.

5.2.2.1 Protective Equipment

1. Full-face SCBA (self-contained breathing apparatus) or pressure-demand supplied-air respirator with 5- minute escape pack
2. Poly-coated chemical-resistant coveralls (e.g., tyvek overalls)
3. Chemical resistant outer gloves (taped to sleeves) and inner gloves
4. Outer disposable boots (taped to cuffs)
5. Hard hat and steel toe boots
6. Available 5-minute escape packs

5.2.2.2 Selection Criteria

1. Atmospheric contaminant concentrations have exceeded Level C criteria and the SSM has deemed Level B protection necessary.
2. Level A protection will be implemented should total encapsulation of personal be deemed necessary.

5.2.3 Level C

Based on preliminary air monitoring and previous field investigations at the Site, most activities conducted within the exclusion zone should be conducted in Level C.

During the performance of field activities, such as test pit excavation, well drilling, and soil boring, on-site work areas will be considered work exclusion zones. These work exclusion zones will surround the location of the field activity. Air monitoring equipment will be used to determine the level of protection needed in the work area. All personnel entering a work exclusion zone will be required to use the level of protection that has been deemed appropriate.

Level C safety equipment will be required when entering a work area in the exclusion zone if VOC concentrations are greater than background levels and less than 20 ppm as measured with FIDs or PIDs.

Level C protective equipment will be worn when conditions within the exclusion zone will present a dust hazard. Non-volatile organics are present in the soil and may pose an inhalation and skin absorption hazard when dust particles are generated. The SSM and/or Field Operations Manager will determine if upgrade from Level D is warranted under these conditions.

5.2.3.1 Protective Equipment

1. Full-face air-purifying respirator with appropriate cartridges and/or Hepa filters to provide protection from acids, volatile and non-volatile organic vapors, and particulates.

2. Poly-coated chemical-resistant coveralls (e.g., tyvek overalls)
3. Chemical resistant outer gloves (taped to sleeves) and inner gloves
4. Outer disposable boots (taped to cuffs)
5. Hard hat and steel-toed boots
6. 5-minute escape packs (available)

5.2.3.2 Selection Criteria

1. Atmospheric contaminant above background concentration and not greater than 20 ppm.
2. Conditions are such that small exposed areas about the head and neck will not be contacted by hazardous substances that pose a significant skin adsorption hazard.
3. Service limit of respiratory cartridges will not be exceeded.
4. Atmosphere contains between 19.5-25 percent oxygen.
5. Atmosphere contains between background levels and 5 ppm volatile organics using FID and/or PID, or testing for specific compounds, indicating that appropriate exposure limits are not being exceeded.

5.2.4 Level D

Level D equipment will be worn in areas where contact with highly contaminated materials is unlikely. Based on preliminary air monitoring and previous field investigations at the Site, it is anticipated that all off-site field work will be conducted in Level D.

5.2.4.1 Protective Equipment

1. Full-face air-purifying respirator (readily available) with organic vapor and/or Hepa filter canisters.
2. Cotton work coveralls or chemical resistant coveralls (e.g., tyvek)
3. Hard hat and steel-toed boots
4. Protective gloves (optional)
5. Goggles or safety glasses
6. Outer disposable boots
7. Face shield as determined by SSO and Site Manager

5.2.4.2 Selection Criteria

Level D protection is the basic work uniform. It can be worn in areas where only boots can be contaminated, no visible toxic substances are present, and VOC concentrations are equal to or less than background levels or 0 ppm.

5.3 Special Procedures for Subsurface Activities

Off-site, special precautions are required since work areas are accessible to the public. The public will be kept from entering the drilling area. Off-site activities will be conducted using Level D protection. On-site, subsurface excavations and drilling may disturb contaminated materials. Therefore, access will be restricted at all sampling locations. At each borehole or excavation site, a work-zone exclusion area of at least a 25-foot radius will be established. On-site and off-site subsurface activities will be performed using appropriate levels of protection. Appropriate personnel protection levels will be confirmed at each location based on regular air monitoring using PIDs and FIDs. Hard hats, safety glasses, and steel-toed safety shoes will be worn during all subsurface and drilling activities.

Prior to beginning any subsurface activity, local utilities (gas, electric, water, sewer, telephone, etc.) must be contacted to determine if any lines are in the subsurface activity area. Blueprints from Ruetgers-Nease may also provide on-site information. This information must be documented.

5.4 Special Procedures for Test Pit Operations

Test pit operations require special safety precautions due to the potential for collapse of the test pit walls. Shallow test pits constructed in firm ground are generally stable and do not require wall sheeting; however, pits which are excavated in unstable soil or those which extend to depths beyond the range of four to five feet may require sheeting if personnel will enter the pit. The type and extent of sheeting required will be determined, based on

field conditions, by the SSM. All test pit operations must conform to the OSHA standard 29 CFR 1926. subpart P, Excavations, Trenching and Shoring. Under no conditions should field personnel enter a test pit, or a sheeted pit unless the person has obtained a confined space entry permit from Field Operations Manager or SSM. Hard hats, safety glasses, and steel-toed shoes or boots are to be worn at all times during test pit excavations. Appropriate personal protection levels will be determined by the SSM or Field Operations Manager at each pit location based upon criteria established in Section 5.2.

Chemical vapors may become trapped at the bottom of a test pit. Therefore, personnel entering such a pit may have to follow confined space procedures. These procedures include testing the atmosphere in the pit with a combustible/toxic/O₂ meter (explosimeter) and following the buddy system (one person on top of pit to watch the person below who is attached with a safety harness and life line).

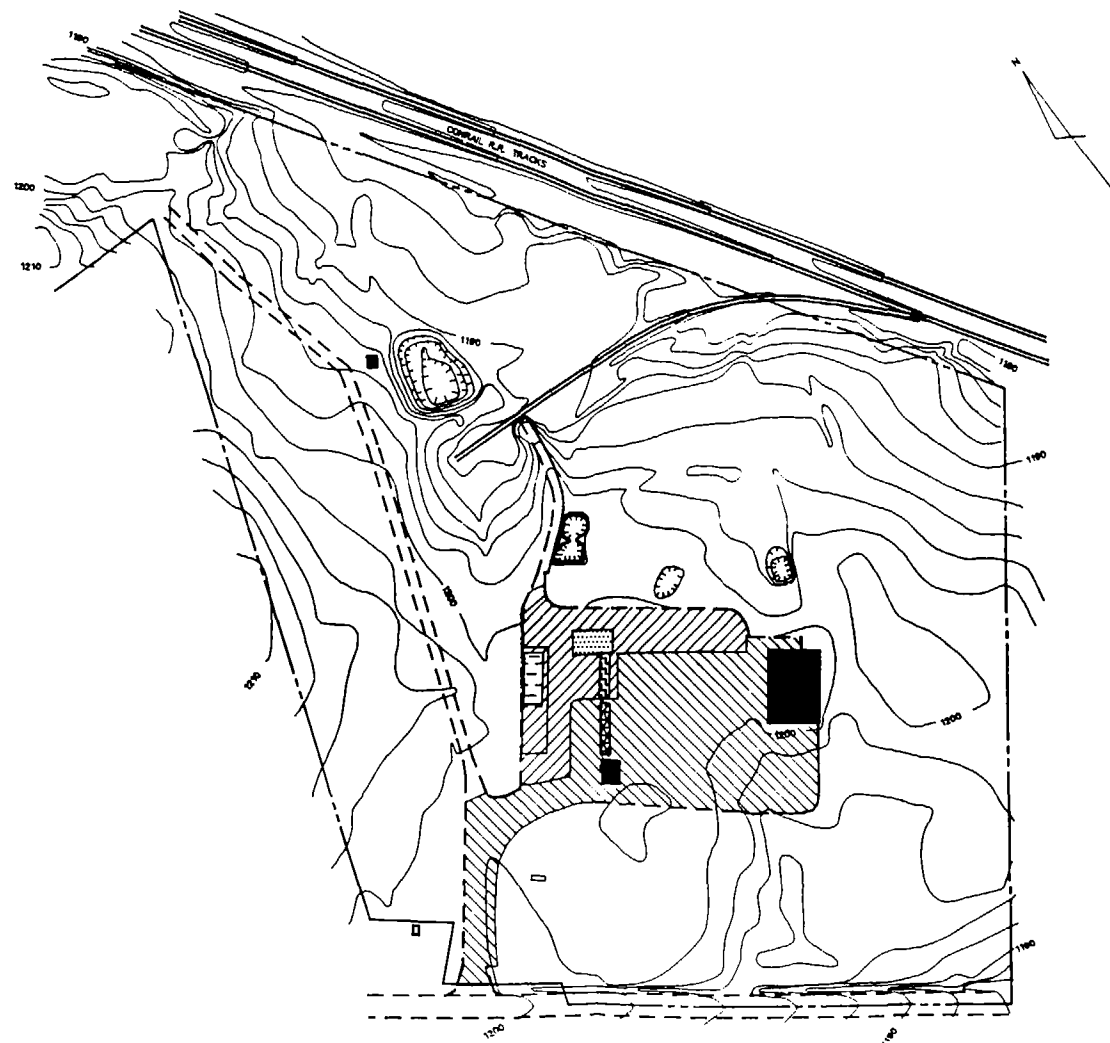
6.0 SITE CONTROL

The Site will be divided into three specific zones to control site activities: Zone 1, exclusion zone (EZ); Zone 2, contamination reduction zone (CRZ); and Zone 3, support zone (SZ) as shown in Figure 6-1. These three zones have been established on the basis of contamination potential ranging from the potentially highest levels of contamination in the exclusion zone to little or no contamination potential in the support zone. The CRZ and SZ will be located at the clear areas along the tiled cement and concrete areas. The EZ will encompass the remainder of the site. Access to the EZ will be limited. The boundaries of these zones may be modified depending on such factors as prevailing winds and organic vapor levels.

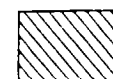
Around each field activity such as test pit excavation, well drilling, and soil boring, a work exclusion area will be defined. The boundaries of such a work exclusion area will surround the location of the field activity. Within the boundaries of the work area, air monitoring equipment will be used to determine the level of protection needed in the work exclusion area. All personnel entering a work exclusion area will be required to use the level of protection that has been deemed appropriate.

6.1 Access-Personnel

Only authorized personnel will have access into the appropriate zones as deemed necessary by the Field Operations Manager and Site Safety Manager.



LEGEND



SUPPORT ZONE



CONTAMINANT
REDUCTION ZONE



DECONTAMINATION



OFFICE TRAILER



DECONTAMINATION
TRAILER



PERSONNEL
DECONTAMINATION
ZONE



EXISTING BUILDING

NOTE: ALL OTHER ON-SITE AREAS
ARE WITHIN THE EXCLUSION ZONE.

SCALE



CONTOUR INTERVAL = 2 FT

FIGURE HSP 6 - 1

EXCLUSION AREAS

RUETTERS-MEASE

SALEM SITE RI/FS

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6.2 Security

A fence has been installed to deter unauthorized personnel from trespassing. Access to the EZ will be from the on-site decontamination pad and personnel decontamination trailer. In addition, signs have been placed on the Site fence stating the following:

Danger

Unauthorized Persons Keep Out

Outside the exclusion zone, there will be trailers for office support and decontamination purposes. All personnel entering the site will sign in and out in the visitor/employee log book which will be maintained in the office trailer.

6.2.1 Communications

A telephone will be installed in the office support trailer. Emergency telephone numbers contained in Section 10.0 will be posted next to the phone.

At the remote areas of the site, in the EZ or the CRZ zones, and at off-site field activities, communication will be maintained by two-way radios. The radio main base will be in the support trailer or with the Field Operations Manager.

6.2.2 Administrative Actions for Violations

Personnel who violate the provisions specified in the HSP will have their actions documented and submitted to their company's supervisor for appropriate disciplinary action.

The document generation and liaison actions will be done by the Project Manager.

If unauthorized personnel enter the area and are not willing to leave the area peacefully, the Field Operations Manager will call the police to remove the trespasser.

6.3 Training Verification

The Site Safety Manager will verify all training of individuals proposed for participation in the investigation at the Site by requesting signed copies of training certificates or official certified copies of transcripts. These transcripts will be submitted to ERM-Midwest for verification. If there are questions of invalid documents, ERM-Midwest will contact training centers by written correspondence and telephone notification. Personnel will not be permitted to enter the CRZ, EZ, or off-site work exclusion areas without the verified training.

7.0 MONITORING EQUIPMENT

The safety equipment which will be used at the Site will include: 1) air monitoring equipment to determine hazardous or potentially hazardous conditions at the Site; 2) personnel protection equipment to properly protect workers during site activities; and 3) emergency equipment in case of emergency incidents at the Site. All safety equipment calibration record forms and data records will be completed and in the document control file at ERM-Midwest.

7.1 Air Monitoring

Air monitoring equipment is used to determine if hazardous conditions exist. Air quality will be regularly monitored to determine the level of volatile organics in the air, the concentration of combustible gases, the concentration of oxygen in the atmosphere, and the presence of toxic gases. Measurements will be recorded on an ongoing basis and more frequently if fluctuations in the measured levels are observed. To ensure that all monitoring instruments are operating properly, a field calibration will be performed and documented as detailed in Section 4 in Volume 3.

7.1.1 Organic Vapors

Air quality will be monitored during site activities by the Site Safety Manager or designated personnel for the presence of volatile organics. The flame ionization detector (FID) will be used as the primary instrument to measure

organic vapors. It is important to note that FID readings should be considered approximate; these values must be used with discretion. A photoionization detector (PID) meter will be used to measure organic vapors if the FID meter is not available.

7.1.2 Oxygen, Combustible Gases, and Toxic Gases

In conjunction with the FID and/or PID meter, readings will be collected at each work site for the presence of oxygen (percentage), combustible gases, and toxic gases. These readings will be displayed and collected from an explosimeter or another appropriate piece of air monitoring equipment.

7.2 Emergency Equipment

7.2.1 Fire Extinguishers

Although the probability of fire at the site is low, fire extinguishers will be readily available throughout the investigation. All fire extinguishers will be Class ABC type. One fire extinguisher will be kept in each field vehicle during any subsurface activity such as drilling or backhoe excavations, and also in the support and decontamination trailers.

7.2.2 First Aid

An industrial first aid kit with sufficient supplies for ten (10) people will be kept in the decontamination trailer. First aid kits will be kept in all field vehicles used at the Site.

An eye wash station will be maintained at the decontamination trailer. Portable eye wash kits with hose (for emergency irrigation of other body parts) will also be kept with the field crews. All eye wash stations will be inspected for water flow and operability. In addition, portable eye wash kits will be checked on a monthly basis.

7.3 Personnel Protection Equipment

The following equipment is required to be available to all personnel at the Site:

1. Full-face respirators
2. Cover lenses and spectacle kits for full-face respirators
3. Safety Glasses and/or Chemical Splash Goggles
4. Respirator cartridges-organic vapor and HEPA filters
5. Vinyl gloves
6. Nitrile latex gloves
7. Coveralls, (e.g., Tyvek, uncoated)
8. Coveralls, (e.g., Tyvek, polycoated)
9. Disposable rubber outer boots
10. Goggles, unvented
11. Hard hats

12. Duct tape (to secure sleeves to gloves and cuffs to boots)
13. Emergency air pack (five minute escape pack e.g., ELSA)
14. Hearing protective ear muffs and/or plugs
15. Rain gear

8.0 WORK LIMITATION LEVELS

Work limitations and conditions when work will be suspended at the site are discussed in the following sections.

8.1 Work Limitation Criteria

All jobs will be carried out as per the directions of the Field Operations Manager and Site Safety Manager.

8.1.1 Air Criteria

The Site Safety Manager or alternate designee is responsible for conducting air monitoring at the Site for Health and Safety purposes. Periodic air monitoring will be conducted during all field operations to determine limitations to work activities. Air monitoring will routinely analyzed for the following parameters:

1. Volatile organic compounds - Measured by a PID (photoionization detector) such as the HNU, or FID (flame ionization detector) such as the Century OVA.
2. Combustible gases - Measured by an explosimeter such as the Gastech GX-82 or a GX-86.
3. Oxygen concentration - Measured by a direct read meter such as the Gastech GX-82 or a GX-86
4. Toxic gases - Measured by a direct read meter such as the Gastech GX-82 or GX-86.

The following action levels or work limitations will be used during the investigation.

1. Volatile Organic Gases

Background levels - Level D personal protection

Background levels ND to 20 ppm - Level C personal protection

Greater than 20 ppm - Level B Personal Protection
500 ppm - evacuate work area until the concentrations have been determined to be at safe levels

Total Encapsulation - Level A personal protection

2. Oxygen

Less than 19.5% - evacuate work site

19.5-25% - routine operations as applicable, monitor other parameters

Greater than 25% - evacuate work site, atmosphere may be explosive

3. Toxic Gases

Action levels will be determined by SSM as related to individual toxic gases (ex. Carbon monoxide, Hydrogen sulfide)

4. Combustible gases

0-10% of LEL - routine operations, monitor other parameters

10-20% of LEL - proceed with caution, continue monitoring

Greater than 20% of LEL - evacuate work area until concentrations return to safe level

8.1.2 Extreme Weather Conditions

Cold-related illness, or cold stress, can occur when working in temperatures at or below freezing. An illness such as frostbite may cause severe injury to the skin and extremities. Unless the victim is obviously contaminated, decontamination should be minimized or omitted and treatment begun immediately. First aid and emergency procedures for handling cold-related disorders are described in Section 10.4.

In order to reduce the occurrence of cold stress, the following will be observed while conducting field activities unless the SSM approves a work rule exception:

1. Drilling and related activities will only be conducted in sustained daily temperatures at or above 25°F.
2. All work involving water will cease when sustained daily temperatures are below 25°F.

Heat-related illnesses, or heat stress, can occur at any time when restrictive protective clothing is worn. An illness such as heatstroke requires prompt treatment to prevent irreversible damage or death. Protective clothing may have to be cut off and decontamination may have to be minimized or omitted to allow treatment to begin immediately. First aid and emergency procedures for handling heat related disorders are described in Section 10.4.

In order to avoid the occurrence of heat stress, continuous physical work may be conducted generally below 86°F. The SSM will consider such factors as the type of protective equipment being worn and physical work being done and will modify the temperature limitations and/or the work

schedule accordingly to further minimize the risk of heat stress.

8.2 Site Evacuation

It is anticipated at this time that necessary evacuation will only involve the immediate evacuation of a work zone area.

8.2.1 Upwind Withdrawal

The Site Safety Manager or Field Operations Manager will determine a safe upwind location for withdrawal from the work zone. Withdrawal will be necessary in the following cases:

1. Work zone air quality concentrations contain hazardous concentrations of volatile organics (greater than 500 ppm), combustible gases (greater than 20 percent LEL), or oxygen percentage above 25% or below 19.5% safety limits for the level of protection being worn (see Section 8.1.1).
2. Occurrence of a minor accident. The victim will undergo decontamination procedures and be transported to a safe upwind location. Field operations will resume after first aid and/or decontamination procedures have been administered to the affected individual and the cause of the accident is identified and corrected by the SSM or Field Operations Manager.
3. Protective clothing, SCBA, and/or respirator malfunctions.

8.2.2 Evacuation of Site

The site will be evacuated in the following cases:

1. The air quality monitoring determines that a majority of the site atmosphere contains greater than 20 percent of LEL combustible gases, or greater than 500 ppm volatile organics, and less than 19.5% or greater than 25% oxygen.
2. A major accident or injury occurs.
3. Fire and/or explosion occurs.

When any of these site evacuation conditions are met, the Field Operations Manager will notify the workers to evacuate the site through two-way radio and/or three blasts from an air horn. All equipment will be turned off and the keys will be left in the vehicle ignitions. Gross decontamination may take place on site or may be omitted at the discretion of the Field Operations Manager. The Field Operations Manager will notify the U.S. EPA and the OEPA and a joint decision will be made whether or not to notify local residents of the emergency and to request emergency assistance from local authorities, if necessary. If the U.S. EPA and/or OEPA cannot be reached and the situation is imminent, the Field Operations Manager will make the decision independently.

9.0 DECONTAMINATION AND HAZARDOUS MATERIALS HANDLING PROCEDURES

The following procedures concerning decontamination and materials handling will be implemented to ensure the health and safety of the site personnel and the general public.

9.1 Decontamination Stations

Decontamination (decon) will take place at three different types of stations:

1. The on-site decon pad (15' x 30')
2. Temporary, off-site work zone decon areas
3. The on-site personnel decon trailer and personnel decon zone. (The decon area will be equipped with changing areas and showers.)

The on-site decon pad will lie within the contaminant reduction zone (see Figure 6-1). The pad will consist of a current concrete slab, with installed curbs along the slab perimeter to retain water (approximately 4 to 6 inches high), and a drainage system. Wash water generated at the decon pad will be collected and stored in an on-site tank for proper disposal. Heavy equipment such as drilling rigs, augers and drilling stems, support vehicles, and backhoe buckets will be decontaminated at the on-site decon pad.

In each off-site work area a temporary decon station will be set up. The primary function of these stations is for personnel decon and decon of sampling equipment. These temporary stations will consist of a plastic tarp placed upon the ground and supplies needed for personnel decon.

All solids (cuttings, soils, etc.) will be collected in 55-gallon drums and stored in the warehouse building pending disposal. All wash fluids and decon related fluids will be collected and stored in an aboveground tank or drums located on-site pending disposal.

The on-site personnel decon trailer and personnel decon zone are within the contaminant reduction zone (see Figure 6-1). The facilities within the decon trailer will include showers and changing areas. Water generated by showers will be collected and stored on-site until the level of contamination is determined and disposed of in accordance with level of contamination. The personnel decon zone consists of a concrete slab adjacent to the personnel decon trailer.

9.2 Equipment Decontamination Procedures

All equipment will be decontaminated prior to and after its use on-site. The following procedures will be used for decontamination of equipment.

9.2.1 Heavy Equipment

Drilling rigs, drilling equipment such as augers and drill stems, support vehicles, backhoe buckets, and any other heavy equipment that has come in contact with potentially contaminated materials will be decontaminated at the on-site decon pad. The procedure for decontamination of heavy equipment is as follows:

1. Remove all loose soil.
2. Steam or high pressure wash (using non-phosphate detergent).

3. Potable water rinse.

9.2.2 Small Sampling Equipment

Small equipment used for sampling includes soil collection equipment, portable electronic equipment, ground water and surface water collection equipment, and soil gas probes.

Equipment used to collect soil samples such as split spoons, shelby tubes, hand augers, stainless steel scoops/trowels, and compositing containers will be decontaminated prior to their initial use, between each sample and between each sample location. The procedure for decontaminating soil sampling equipment is as follows:

<u>Inorganics</u>	<u>Organics</u>
1. Non-phosphate detergent wash	1. Non-phosphate detergent wash
2. 0.1 N HCL rinse	2. Tap water rinse
3. Tap water rinse	3. Deionized/Distilled water rinse
4. Deionized water rinse	4. Methanol rinse
5. Air dry	5. Pesticide quality hexane rinse*
	6. Methanol rinse

Inorganics

Organics

7. Four rinses with
deionized/distilled
water

8. Air dry

* - The use of hexane for decontamination is highly discouraged since hexane is detectable by the volatile analysis (as a TIC). Residual amounts could result in mandatory sample dilutions, and useless data.

All cuttings, soils and fluids generated will be collected and stored on-site until the level of contamination is determined. Disposal will be appropriate for the level of contamination. All decontaminated soil sampling equipment will be stored in clean plastic sheeting. This equipment may be decontaminated at the sampling location.

Electronic equipment such as PIDs, FIDs, explosimeters, portable GCs, and portable pumps used for air sampling will be decontaminated prior to their initial use and at the end of each working day. The procedure for decontaminating electronic equipment is as follows:

1. Brush to remove particulate contamination.
2. Wipe down with a clean, damp cloth (deionized water).
3. Air dry.

Decontaminated electronic equipment will be wrapped in plastic and stored on a clean surface in the office trailer.

This equipment may be decontaminated in the personnel decon zone.

Equipment used for ground water and surface water sampling will be decontaminated before sampling activities begin and between each sample location if dedicated equipment is not used. Water sampling equipment includes pumps, hoses, glass beakers, and bailers. The procedure for decontaminating this equipment is as follows:

Inorganics

1. Non-phosphate
detergent wash
2. 0.1 N HCL rinse
3. Tap water rinse
4. Deionized water rinse
5. Air dry

Organics

1. Non-phosphate
detergent wash
2. Tap water rinse
3. Deionized/Distilled
water rinse
4. Methanol rinse
5. Pesticide quality
hexane rinse
6. Methanol rinse
7. Four rinses with
deionized/distilled
water
8. Air dry

All cuttings, soils and fluids generated will be collected and stored on-site until the level of contamination is determined. Disposal will be appropriate for the level of contamination. All ground water and surface water sampling equipment will be stored in plastic sheeting after it has been decontaminated. This equipment may be decontaminated at each water sample location.

The soil gas probe used during the soil gas survey will be decontaminated using the procedures specified below:

1. Remove loose soil.
2. Non-phosphate soap wash.
3. Potable water rinse.
4. Twice rinsed with deionized water rinse.
5. Field scan with PID and FID.

All cuttings, soils and fluids generated will be collected and stored on-site until the level of contamination is determined. Disposal will be appropriate for the level of contamination. Decontaminated soil gas probes will be stored in plastic sheeting. This equipment may be decontaminated at the soil gas sampling location.

9.2.3 Well Construction Supplies

Supplies used to construct wells will be decontaminated prior to being installed. These supplies include well screens, riser pipes, and outer casings. These supplies will be decontaminated with a steam cleaner at the on-site decon

pad. Decontaminated well supplies will be stored on clean plastic sheeting in the on-site warehouse.

9.3 Personnel Decontamination Procedures

The total personnel decontamination process is divided into a number of individual steps. Each step within the decon process has specific decon tasks that must be performed. Each step is performed at a separate decon "station." Personnel will proceed from station to station until the total decon process has been completed. The process of personnel decon will begin at the on-site personnel decon zone in exclusion area and finish at the on-site personnel decon trailer exit in the support zone.

Personnel decontamination of individuals working at off-site sampling locations will begin in a temporary, off-site decon station and will finish in the on-site personnel decon trailer. Personnel decontamination procedures will be dependent upon the level of protection that has been donned by the personnel. The following sections describe decon procedures for Level A through Level D protection.

9.3.1 Level A Decontamination

Station 1: Segregated Equipment Drop

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Equipment necessary is:

1. Containers of various sizes
2. Plastic liners
3. Plastic drop cloths

Station 2: Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent/water solution.

Equipment necessary is:

1. Container (20 to 30 gal)
2. Decon solution
3. Detergent/water solution
4. Two or three long-handle, soft-bristle brushes

Station 3: Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30 to 50 gal)
2. High-pressure spray unit
3. Potable water
4. Two or three long-handle, soft-bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots first and then tape around gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30 to 50 gal)
2. Plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 6: Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20 to 30 gal)
2. Plastic liners

Station 7: Suit/Safety Boot Wash

Thoroughly wash fully encapsulating suit and boots. Scrub suit and boots with long-handle, soft-bristle scrub brush and copious amounts of decon solution or detergent/water solution. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. Decon Solution
3. Detergent/water solution
4. Two or three long-handle, soft-bristle scrub brushes
5. Small buckets
6. Sponges or cloths

Station 8: Suit/SCBA/Boot/Glove Rinse

Rinse off decon solution or detergent/water solution using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. High-pressure spray unit
3. Potable water
4. Small buckets
5. Two or three long-handle, soft-bristle scrub brushes
6. Sponges or cloths

Station 9: Tank Change

If worker leaves Exclusion Zone to change air tank, this is the last step in the decontamination procedure. Worker's air tank is exchanged, new outer glove and boot covers donned, and joints taped. Worker returns to duty.

Equipment necessary is:

1. Air tanks
2. Tape

3. Boot covers
4. Gloves

Station 10: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 11: Fully Encapsulating Suit and Hardhat Removal

With assistance of helper (helper will be wearing protective suit, Tyvek and gloves), remove fully encapsulating suit and hard hat. Hang suits on rack or lay out on drop cloths.

Equipment necessary is:

1. Rack
2. Drop Cloths
3. Bench or stool

Station 12: SCBA Backpack Removal

While still wearing facepiece, remove backpack and place on table. Disconnect hose from regulator valve and proceed to next station.

The only equipment necessary is a table.

Station 13: Inner-Glove Wash

Wash with decon solution or detergent/water solution that will not harm skin. Repeat as many times as necessary.

Equipment necessary is:

1. Basin or bucket
2. Decon solution
3. Detergent/water solution
4. Small table

Station 14: Inner-Glove Rinse

Rinse with water. Repeat as many times as necessary.

Equipment necessary is:

1. Potable water
2. Basin or bucket
3. Small table

Station 15: Facepiece Removal

Remove facepiece. Deposit in container with plastic liner. Avoid touching face with fingers.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners

Station 16: Inner-Glove Removal

Remove inner gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 17: Inner-Clothing Removal

Remove clothing soaked with perspiration. Place in container with plastic liner. Do not wear inner clothing off the site, since there is a possibility that small amounts of contaminants have been transferred in removing fully encapsulating suit.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners

Station 18: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present.

Equipment necessary is:

1. Potable water
2. Soap
3. Small table
4. Basin or bucket
5. Field Showers
6. Towels

Station 19: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather.

Equipment needed

1. Tables
2. Chairs
3. Lockers
4. Clothes

9.3.2 Level B Decontamination

Procedure for Full Decontamination

Station 1: Segregated Equipment Drop

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Equipment necessary is:

1. Containers of various sizes
2. Plastic liners
3. Plastic drop cloths

Station 2: Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent/water solution.

Equipment necessary is:

1. Container (20-30 gal)
2. Decon solution

3. Detergent/water solution
4. Two or three long-handle, soft-bristle scrub brushes

Station 3: Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. High-pressure spray unit
3. Potable water
4. Two or three long-handle, soft-bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots first and then remove tape around gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 6: Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 7: Safety Boot Wash

Thoroughly wash splash suit and safety boots. Scrub with long-handle, soft-bristle scrub brush and copious amounts of decon solution or detergent/water solution. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. Decon solution
3. Detergent/water solution
4. Two or three long-handle, soft-bristle scrub brushes

Station 8: Safety Boot Rinse

Rinse off decon solution or detergent/water solution using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30 to 50 gal)
2. High-pressure spray unit
3. Potable water
4. Two or three long-handle, soft-bristle scrub brushes

Station 9: Tank Change

If worker leaves Exclusion Zone to change air tank, this is the last step in the decontamination procedure. Worker's air tank is exchanged, new outer gloves and boot covers donned, and joints taped. Worker then returns to duty.

Equipment necessary is:

1. Air tanks
2. Tape
3. Boot covers
4. Gloves

Station 10: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 11: SCBA Backpack Removal

While still wearing facepiece, remove backpack and place on table. Disconnect hose from regulator valve and proceed to next station. If wearing a 5-minute escape, remove escape bottle and harness while still wearing facepiece.

The only equipment necessary is a table.

Station 12: Protective Suit Removal

With assistance of helper (helper will be wearing protective suit, Tyvek, and gloves), remove splash suit. Deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 13: Inner Glove Wash

Wash inner gloves with decon solution or detergent/water solution that will not harm skin. Repeat as many times as necessary.

Equipment necessary is:

1. Decon solution
2. Detergent/water solution
3. Basin or bucket
4. Small table

Station 14: Inner Glove Rinse

Rinse inner gloves with water. Repeat as many times as necessary.

Equipment necessary is:

1. Potable water
2. Basin or bucket
3. Small Table

Station 15: Facepiece Removal

Remove facepiece. Avoid touching face with gloves.
Deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners

Station 16: Inner Glove Removal

Remove inner gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 17: Inner Clothing Removal

Remove clothing soaked with perspiration. Place in container with plastic liner. Do not wear inner clothing off the site since there is a possibility that small amounts of contaminants have been transferred in removing fully encapsulating suit.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners

Station 18: Field Wash

Shower if highly toxic, skin corrosive, or skin-absorbable materials are known or suspected to be present.

Equipment necessary is:

1. Potable Water
2. Soap
3. Small table
4. Basins or buckets
5. Field showers
6. Towels

Station 19: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather.

Equipment necessary is:

1. Tables
2. Chairs
3. Lockers
4. Clothes

9.3.3 Level C Decontamination

Procedure for Full Decontamination

Station 1: Segregated Equipment Drop

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different

containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Equipment necessary is:

1. Containers of various sizes
2. Plastic liners
3. Plastic drop cloths

Station 2: Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent/water solution.

Equipment necessary is:

1. Container (20-30 gal)
2. Decon solution
3. Detergent/water solution
4. Two or three long-handle, soft-bristle scrub brushes

Station 3: Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. High-pressure spray unit
3. Potable water
4. Two or three long-handle, soft-bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots first and then remove tape around gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 6: Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 7: Safety Boot Wash

Thoroughly wash safety boots. Scrub with long-handle, soft-bristle scrub brush and copious amounts of decon solution or detergent/water solution.

Equipment necessary is:

1. Container (30-50 gal)
2. Decon solution
3. Detergent/water solution
4. Two or three long-handle, soft-bristle scrub brushes

Station 8: Safety Boot Rinse

Rinse off decon solution or detergent/water solution using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. High-pressure spray unit
3. Potable water
4. Two or three long-handle, soft-bristle scrub brushes

Station 9: Canister or Mask Change

If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer glove and boot covers donned, and joints taped. Worker returns to duty.

Equipment necessary is:

1. Canister (or mask)
2. Tape
3. Boot covers
4. Gloves
5. Container for used canisters

Station 10: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 11: Protective Suit Removal

With assistance of helper, (helper will be wearing protective suit, Tyvek, and glove) remove splash suit. Deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Bench or stool
3. Plastic liner

Station 12: Inner Glove Wash

Wash inner gloves with decon solution or detergent/water solution that will not harm skin. Repeat as many times as necessary.

Equipment necessary is:

1. Decon solution
2. Detergent/water solution
3. Basin or bucket

Station 13: Inner Glove Rinse

Rinse inner gloves with water. Repeat as many times as necessary.

Equipment necessary is:

1. Potable water
2. Basin or bucket
3. Small table

Station 14: Facepiece Removal and Wash

Remove facepiece. Avoid touching face with gloves. Deposit facepiece in container with plastic liner.

Equipment necessary is:

1. Decon solution
2. Potable water
3. Basin or bucket

Station 15: Face Piece Rinse

Rinse face piece with water, towel dry and place in sealable plastic bag.

Equipment necessary is:

1. Potable water
2. Basin or bucket
3. High pressure spray mist
4. Plastic bags
5. Towels
6. Used towel container

Station 16: Inner Glove Removal

Remove inner gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 17: Inner Clothing Removal

Remove clothing soaked with perspiration. Place in container with plastic liner. Do not wear inner clothing off the site since there is a possibility small amounts of contaminants have been transferred in removing fully encapsulating suit.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners

Station 18: Field Wash

Shower if highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.

Equipment necessary is:

1. Potable Water
2. Soap
3. Tables
4. Wash basins or buckets
5. Field Showers

6. Towels
7. Used towel container

Station 19: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather.

Equipment necessary is:

1. Tables
2. Chairs
3. Lockers
4. Clothes

9.3.4 Level D Decontamination

Procedure for Full Decontamination

Station 1: Segregated Equipment Drop

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Equipment necessary is:

1. Containers of various sizes
2. Plastic liners
3. Plastic drop cloths

Station 2: Boot and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent/water solution.

Equipment necessary is:

1. Container (20-30 gal)
2. Decon solution
3. Detergent/water solution
4. Two or three long-handle, soft-bristle scrub brushes

Station 3: Boot and Glove Rinse

Rinse off decon solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment necessary is:

1. Container (30-50 gal)
2. High-pressure spray unit
3. Potable Water
4. Two or three long-handle, soft-bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots and gloves and deposit in container with plastic liner.

Equipment necessary is:

1. Container (20-30 gal)
2. Plastic liners

Station 5: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment necessary is:

1. Container (30-50 gal)
2. Plastic liners
3. Bench or stool

Station 6: Protective Suit or Cotton Overalls Removal

With assistance of helper, remove protective suit or cotton overalls. Deposit in container with plastic liner.

Equipment necessary is:

1. Bench or stool
2. Plastic liner

Station 7: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.

Equipment necessary is:

1. Potable water
2. Soap
3. Tables
4. Wash basins or buckets
5. Field Showers
6. Towels

Station 8: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather.

Equipment necessary is:

1. Tables
2. Chairs
3. Lockers
4. Clothes

9.4 Hazardous Materials Handling Procedures

This section concerns the off-site and on-site handling of hazardous materials.

9.4.1 Off-Site

Wells drilled and developed in the off-site areas will encounter potentially contaminated materials such as contaminated rock, soil, and water.

Before drilling a well, a plastic tarp will be placed around the intended drilling location to allow the cuttings to be collected once drilling has begun. These cuttings will be drummed and brought on-site to await proper disposal.

Exposed portions of drilling rigs that may contact potentially contaminated materials will be covered with plastic sheeting to prevent contamination of the vehicle's wheels during drilling. This will inhibit potentially contaminated soils from being deposited on public roadways while the rig is in transport to the on-site decon pad.

Drilling equipment such as augers may be wrapped in plastic sheeting prior to transport to the on-site decontamination area.

The water brought to the ground surface during well development procedures and Round 1 purging will be placed in containers, transported, and stored in a tank on site for proper disposal.

9.4.2 On-Site

Soil borings, test pit construction and well purging will be handled according to the following procedures.

The soil brought to ground surface during boring procedures will be replaced with grout once drilling of the boring is finished. All boring cuttings will be containerized.

Similarly, soil brought to the ground surface during test pit construction will be returned to the pit once excavation of the pit has finished. The soils removed from the test pit will be returned to the pit in the order reversed from the order in which it was removed from the pit. This will insure soils are returned to their original depth within the pit.

The water brought to the surface during the purging of on-site wells will be placed in containers, transported, and stored in a tank on site for proper disposal.

10.0 EMERGENCY PROCEDURES AND CONTACTS

The HSP for this project has been established to allow site operations to be conducted without adverse impacts on the worker or public Health and Safety.

10.1 General Medical Procedures

In the event of an emergency, appropriate corrective measures must immediately be taken to assist those who have been injured or exposed and to protect others from hazard. The Field Operations Manager should be immediately notified of the incident and, if necessary, first aid will be rendered.

Accident reports will be completed as necessary, returned to the Health and Safety officer, and kept in the document control file at ERM-Midwest's Health Services Department. These and other forms are described in Section 11.0 and can be found in Appendix B.

In life threatening situations, care must be instituted immediately without considering decontamination protocol. Outside protective clothing can be removed if it does not cause delays, interfere with treatment, or aggravate the problem. Respirators must always be removed. If outer contaminated garments cannot be safely removed, the individual should be wrapped in suitable material to help prevent contaminating ambulances and/or medical personnel. For minor medical problems or injuries, normal decontamination procedures should be followed when at all possible.

First aid or other appropriate initial action will be administered by those closest to the accident/unusual event.

This assistance will be conducted in a manner to assure that those rendering assistance are not placed in a situation of unacceptable risk. Listings of on-site Emergency Medical Technicians will be posted in prominent locations.

All OSHA-recordable injuries, accidents involving property damage, and unusual events must be reported to the Site Safety Manager or Field Operations Manager. Upon notification, the Site Safety Manager or Field Operations Manager will conduct an investigation and complete the Accident Report Form, attached in Appendix B. The Project Coordinator, Project Manager, and the Agencies' on-site representative will be informed of the accident or event within 24 hours of being reported to the Site Safety Manager or Field Operations Manager.

After reviewing the Accident Report Form, the Site Safety Manager will complete the Accident Investigation Information Report, Appendix B. The completed forms will then be filed at the site for review by regulatory personnel.

The Field Operations Manager will be responsible for insuring that all corrective actions identified by the Accident Investigation Information are implemented.

The Site Safety Manager or Field Operations Manager will decide if off-site assistance and/or medical treatment is required and he will arrange for assistance. Off-site coordination and assistance procedures will be prearranged with local ambulance companies, hospitals, and doctors or other medical specialists.

All workers on site are responsible for conducting themselves in a mature, calm manner in the event of an accident/unusual event. All personnel must conduct

themselves in a manner to avoid spreading the danger to themselves and to surrounding workers.

The following emergency equipment will be available on the site:

- o First aid kit
- o Fire extinguisher and blanket
- o Cool wet towels or sheets
- o Stretcher
- o Emergency eyewash station
- o Hand-held air horns
- o Egress air packs
- o Absorbent material
- o Plentiful supply of potable water

10.2 Emergency Horn

All personnel will be informed of an emergency situation which requires suspension of site operations; egression from the work area; emergency responses; and if necessary, site evacuation via horn blasts as defined during site employee briefings. Radio communication may also be used in addition to the horn blasts.

10.3 Evacuation Plan

Although very unlikely, it is possible that a site emergency could necessitate evacuating all personnel from the site. If such a situation should arise, the Site Safety Manager or Field Operations Manager will notify the on-scene U.S. EPA/OEPA representative of this event and the appropriate horn blast will be given for site evacuation. It

is the responsibility of these individuals to evacuate personnel in a calm, controlled fashion.

All available vehicles will be used in the evacuation if they are needed. All personnel will exit the site and be taken to a rendezvous point selected by the Site Safety Manager or Field Operations Manager.

The Field Operations Manager's log of on-site personnel will be used to ensure that all individuals have been evacuated. If someone is missing, the Site Safety Manager or Field Operations Manager will alert the appropriate emergency personnel. Control of personnel at the rendezvous point is the responsibility of the Field Operations Manager or designated assistant. Appropriate emergency contact will be made when evacuation is necessary.

10.4 Cold/Hot Weather Related Emergencies

Cold weather related emergencies include frostbite, trench foot, and hypothermia. Treatment of individuals experiencing any of these injuries will be administered immediately. Employees will be monitored by the SSO and/or Field Operations Manager to detect signs of cold weather related emergencies.

Frostbite occurs when there is actual freezing of the tissues with the attendant mechanical disruption of cell structure. With increasing wind velocity, heat loss is greater and frostbite will occur more rapidly. Once started, freezing progresses rapidly. Furthermore, if the skin comes in direct contact with objects whose surface temperature is below freezing point, frostbite may develop in spite of warm environmental temperatures. The first warning of frostbite is often a sharp, pricking sensation. However, cold itself

produces numbness and anesthesia which may permit serious freezing to develop without the warning of acute discomfort. Injury produced by frostbite may range from simple superficial injury with redness of the skin, transient anesthesia and superficial bullae to deep tissue freezing with persisting ischemia, thrombosis, deep cyanosis, and gangrene.

If detected, individuals with frostbite will be transported to an emergency facility.

Trench foot or immersion foot may be caused by long continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. This condition is due to persistent local tissue anoxia, combined with mild or severe cold, with a resultant injury to the capillary walls. Edema, tingling, itching, and severe pain occur and may be followed by blistering, superficial skin necrosis, and ulceration.

If trench foot is detected, the individual will be placed in blankets and moved to a warm, dry location. If symptoms persist, the individual will get medical attention.

General hypothermia is an extreme acute problem resulting from prolonged exposure to cold and heat loss. If an individual becomes fatigued during physical activity, he will be more prone to heat loss, and as exhaustion approaches, the vasoconstrictor mechanism is overpowered; then sudden vasodilatation occurs with a resultant rapid loss of heat, and critical cooling ensues. Sedative drugs and alcohol increase the danger of hypothermia.

If hypothermia is detected the individual will be wrapped with blankets and transported immediately to an emergency facility.

Heat related emergencies can range from heat cramps to life threatening heatstroke. Treatment of individuals suffering from any of these injuries will be administered immediately. Employees will be monitored by the Site Safety Manager to detect signs of heat related emergencies.

Heat rash (prickly heat) may be caused by unrelieved exposure to hot and humid air as may occur in warm-moist climatic zones. The orifices of the sweat ducts become plugged due to the swelling of the moist keratin layer of the skin which leads to inflammation of the glands. There are tiny red vesicles visible in the affected skin area and, if the affected area is extensive, sweating can be substantially impaired. As a consequence heat rash not only is a nuisance because of the discomfort it causes but also can greatly diminish the worker's capacity to tolerate heat.

Heat cramps may occur after prolonged exposure to heat with profuse perspiration and inadequate replacement of salt. The signs and symptoms of heat cramps consist of spasm and pain in the muscles of the abdomen and extremities. Albuminuria may be a transient finding.

Heat cramps will be treated by administration of water, removal of the individual to a cool, shaded location, and rest.

Heat exhaustion may result from physical exertion in a hot environment when vasomotor control and cardiac output are inadequate to meet the increased demand placed upon them by peripheral vasodilatation or the plasma volume is reduced by dehydration. Signs and symptoms of heat exhaustion may include palor, lassitude, dizziness, syncope, profuse sweating, and cool moist skin. There may or may not also be a mild hyperthermia.

Heat exhaustion will be treated by elevating the individual's feet, transporting the individual to a cool, shaded area, administering of water, applying of cool water compresses, and transporting the individual to an emergency facility if individual response is not rapid and full.

Heat stroke is a serious medical condition. An important predisposing factor is excessive physical exertion. Signs and symptoms may include dizziness, nausea, severe headache, hot dry skin because of cessation of sweating, very high body temperature (usually 106°F and rising), confusion, collapse, delirium, and coma. Often circulation is also compromised to the point of shock. If cooling of the victim's body is not started immediately, irreversible damage to vital organs may develop, leading to death.

Heatstroke will be treated as a true medical emergency. An ambulance will be called as soon as an individual has been diagnosed as suffering from heatstroke. An immediate attempt will be made to decrease the body temperature as rapidly as possible by applying cold wet sheets or compresses and placing the individual supine, feet elevated, in the decontamination trailer until transportation to emergency care facilities is possible.

For work limitations and precautions for avoiding heat and cold related injuries see Section 8.1.2 of the HSP.

10.5 Chemical Exposure

Exposure to chemicals can be divided into two categories:

- o Injuries from direct contact, such as acid burns or inhalation of toxic chemicals.

- o Potential injury due to gross contamination of clothing or equipment.

For the inhaled contaminant, treatment can only be provided by qualified physicians. If the contaminant is on the skin or in the eyes, immediate measures must be taken to counteract the substance's effect. First aid treatment usually consists of flooding the affected area with water; however, for a select few chemicals, water may cause more severe problems.

When protective clothing is grossly contaminated, contaminants may be transferred to treatment personnel or the wearer and cause injuries. Unless severe medical problems will be aggravated by splashing water, the protective clothing should be washed off as rapidly as possible and carefully removed. Portable eye washes and potable water will be available to provide a means of flushing and washing such contamination.

If the injury to the worker results from a chemical splash or uncontrolled release, the following first aid procedures are to be instituted:

- o Eye Exposure - If contaminated solids or liquids get into the eyes, wash eyes immediately at the emergency eyewash station using large amounts of water and lifting the lower and upper lids occasionally. Obtain medical attention immediately. Contact lenses will not be worn when working on the site.
- o Skin Exposure - If contaminated solids or liquids get on the skin, promptly wash the contaminated skin using soap or mild detergent and water. If

severely contaminated material penetrates through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water.

Obtain medical attention immediately when exposed to such material.

- o Breathing - If a person breathes in large amounts of contaminants, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration immediately. Keep the affected person warm and at rest. Obtain medical attention as soon as possible. Certified CPR personnel will be on-site at all times during field activities.
- o Swallowing - When contaminants have been swallowed and the person is conscious. Attempt to obtain information to aid in identifying the substance swallowed from the person. Contact the poison control center immediately. The poison control center may direct responder to induce vomiting. Do not induce vomiting if: (1) The person is unconscious or semiconscious, or having a convulsions; (2) if a strong corrosive has been swallowed; or (3) if a petroleum product has been swallowed. Vomiting is best induced by administering one tablespoon of syrup of ipecac. Transport the person to the hospital and monitor the airway constantly.

10.6 Fires

Fire extinguishers (type ABC) will be available on site. If a small localized fire breaks out, fire extinguishers will

be used to bring the occurrence under control. If necessary and feasible, a fire blanket, soil, or other inert materials will be placed on the burning area to extinguish the flames and minimize the potential for spreading. If appropriate, local fire-fighting authorities will be contacted for assistance.

If an uncontrolled fire develops releasing potentially toxic gases, on-site personnel and the public in the immediate vicinity will be evacuated. Only personnel trained in fire fighting and outfitted with the proper protective equipment will be allowed in the immediate fire area. The Field Operations Manager or his designated assistant will alert local fire-fighting companies.

10.7 Soils

Handling procedures have been developed to limit potential problems with material spillage. In the event of a spill at the site, the area will be isolated from traffic patterns by the Site Safety Manager or Field Operations Manager. Liquid spills will be solidified with absorbent material and loaded with a front-end loader or other means into a truck for on-site storage. If the spill involves a direct or potential release from the site, local, state, or federal agencies will be notified as appropriate to protect the public.

10.8 Unusual Objects or Events

Although highly unlikely, unusual objects (e.g., buried pressurized, gas cylinders, bulging drums, fuming containers) could be encountered during boring and sampling operations. When such objects are encountered, the Field Operations

Manager will halt operations and notify the Site Safety Manager. The Field Operations Manager or Project Manager will consult the U.S. EPA and the OEPA Project Manager to decide on the next course of action.

10.9 Emergency Personnel

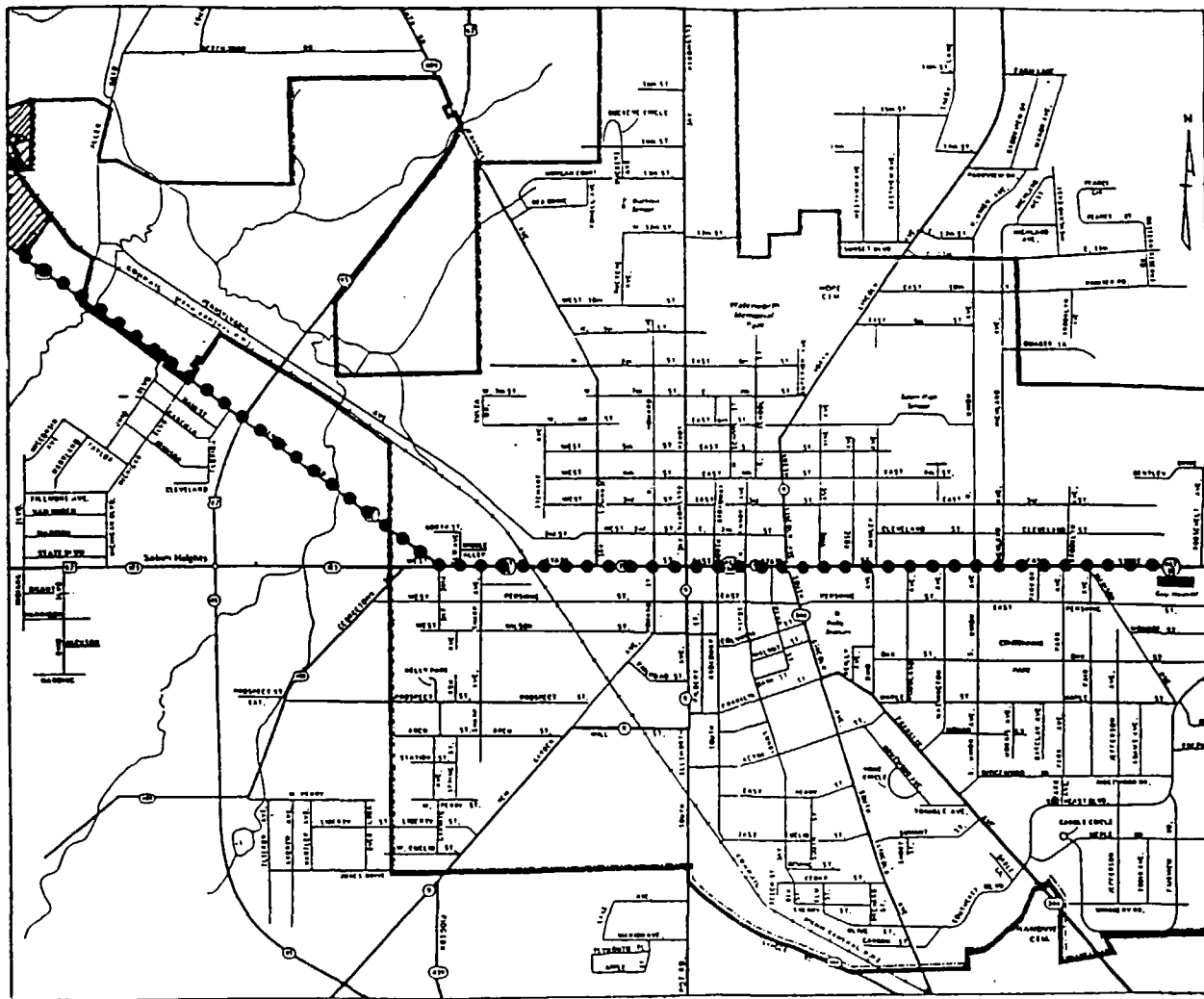
In the event of an emergency, access to the Site will be granted to emergency personnel. Ambulance/Emergency Medical Technical personnel will suit up in coveralls, tyveks, and respirators (their own, respirators at site will not be provided) before entering contaminated areas. Firemen will suit up in basic personnel protective equipment before proceeding to the emergency occurrence. In the case of an emergency in which time is critical, Health and Safety requirements may be waived.

10.10 Emergency Contacts

The closest emergency care service is the Salem Community Hospital which is located approximately 2 3/4 miles from the site. The preferred route to the Hospital is shown in Figure 10-1.

Should any emergency situation or other unplanned occurrence require outside services, the appropriate contacts from the following list will be made:

<u>Agency</u>	<u>Address</u>	<u>Telephone No.</u>
Fire	Salem Twp. Western Section Fire Dept.	(216) 222-1234



LEGEND



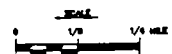
-  RUETUCKS - MEASE SITE
-  ROUTE TO HOSPITAL

FIGURE HSP 10 - 1
ROUTE TO SALEM
COMMUNITY HOSPITAL



REVISED 10.88

ERM - Midwest, Inc.

<u>Agency</u>	<u>Address</u>	<u>Telephone No.</u>
Ambulance	Advanced Gold Cross Ambulance 383 N. Lincoln Salem, OH	(216) 337-3441
Poison Control Center	Mahoning Valley St. Elizabeth's Med.Cntr. 1044 Belmont Ave. Youngstown, OH	(216) 764-2222
Hospital	Salem Community Hospital 1995 E. State Street Salem, OH	(216) 332-7166
Police	Salem Township Western Section	(216) 337-8112
U.S. EPA (Ms. Amy Blumberg)	Chicago, IL	(312) 886-7341
OEPA (Ms. Susan MacMillan)	Twinsburg, OH	(216) 425-9171
Mr. Steven Foard Project Coordinator	State College, PA	(814) 238-2424
ERM-Midwest Columbus, OH		(614) 433-7900

11.0 FIELD DOCUMENTATION OF HEALTH AND SAFETY PROCEDURES

The following forms are described in this section and can be found in Appendix B:

1. Plan Acceptance Form.
2. Health Certification Form.
3. Accident Report Form.
4. Accident Investigation Form (by SSO).
5. Respiratory Issuance Form.
6. Hearing Protection Issuance Form.
7. Sampling Equipment Calibration Form.
8. Sampling Data Form.
9. Air Monitoring Form.

The Plan Acceptance Form will be completed by all personnel working at the Site. The Accident Report Form will be completed by the Field Operations Manager or Site Safety Manager and the Accident Investigation form will be completed by the Site Safety Manager in the event that an accident occurs. The Air Monitoring Form will contain the OVA monitoring records, and the Sampling Data form will contain the records for the detector tube air and other quantifying samples from the work-zone. The respirator and hearing protection issuance forms contain information concerning the equipment issued to the personnel and will be completed by either the Site Safety Manager or the Health and Safety Officer. The Health Certification Form documents the

physician's approval of the individual for use of a respirator, hearing protection, and general health.

All completed forms will be returned to the Health & Safety Officer. Additionally, all forms and records generated as required by the HSP will be organized and stored in accordance with the guidelines contained in the Data Management Plan, as required under Federal Privacy Act, 504 Civil Rights Handicapped & Disabled Regulations & OSHA 29 CFR 1910.20 Recordkeeping.

12.0 MEDICAL SURVEILLANCE PROGRAM

To safeguard the health of response personnel, a medical surveillance program has been established.

12.1 Background

Prior to commencing work at hazardous waste sites, ERM-Midwest employees must undergo a thorough physical examination if not performed within the preceding 12 months. At present, they are conducted by Urgent Medical Care in Columbus, Ohio as required by ERM-Midwest's Medical Surveillance Program. Pre-site investigation medical examinations establish each individual's state of health, provide baseline physiological and psychological data, and assess the individual's ability to cope with the stress of hazardous waste site investigations.

Annual medical examinations are conducted to assess the health status of individual workers as to their fitness for continued assignments at hazardous waste sites. Periodic or follow-up medical evaluation of individual workers will be conducted as deemed necessary by ERM-Midwest's Health & Safety Officer and Medical Advisor per exposure to various environmental factors. The content and frequency of these examinations is influenced by the kinds of work and exposures encountered by each individual. The frequency of these follow-up examinations is established by the Health and Safety Officer in conjunction with the Medical Advisor.

12.2 Physical Examination

Each individual receives a thorough physical examination which includes an evaluation of blood counts and blood chemistry to assess blood-forming, kidney, liver, and

metabolic functions. The examining physician, or his/her immediate supervisor, will be accredited by the American Occupational Medical Association (AOMA). In addition, the physician and/or appropriate medical staff professional(s) will be certified by the Council of Accreditation in Occupational Hearing Conservation (29 CFR 1910.95 (g)(3) Noise Standard) in order to perform and interpret audiograms/audiometric tests. Pulmonary function tests will be performed by certified spirometrists who have taken the required NIOSH spirometry course. X-rays will be read by a technician with a B license. Specifically, the physical examination consists of the following elements:

Physical Examination

1. Review of personal and family health history
2. Nutritional evaluation
3. Cardiovascular risk analysis
4. Daily pressure questionnaire
5. Complete physical examination
6. History of occupational exposures
7. Eye tests:
 - Near and distant vision
 - Color vision
 - Peripheral vision
 - Depth perception
8. Hearing test (Audiometric screening)
9. Electrocardiogram, 12 lead

10. Pulmonary function study (functional lung capacity)
11. Gastrointestinal System
12. Genitourinary Disorders
13. Chest X-Ray

Laboratory Studies

1. Hematology
 - Red blood count
 - White blood count
2. Differential
 - Polys - Lymphs - Mono
 - Eos - Baso
3. Blood chemistries (26)
 - Calcium - Direct Bilirubin
 - BUN/Creat ratio - LDH
 - Creatinine - Total lipids
 - Total protein - Chloride
 - Total Bilirubin - T4
 - Alk. Phosphatase - BUN
 - Iron - Glucose
 - Potassium - Globulin
 - Triglycerides - SGOT
 - Phosphorus - SGPT
 - Uric Acid - Cholesterol
 - Albumin - Sodium
 - Alb/glob ratio - GGTP

4. Urogram:

- | | |
|-----------|--------------------|
| - Acetone | - Specific gravity |
| - Glucose | - Blood |
| - Albumin | - pH |

5. Serology - IgE
- IgG

6. Papanicolaou (PAP) test for cervical cancer (female staff)

Summary reports of the examinations are sent to each employee at their home address and to ERM-Midwest's Personnel Department and kept on file in the individual's personnel file. Full results of each physical are sent to each employee's personal physician upon written request and/or authorization of employee/employer. The original reports are kept at Urgent Medical Care.

13.0 PERSONNEL TRAINING

Prior to beginning field work at the Salem Site, all individuals required to work in the exclusion zone and contaminant reduction zone will have completed the required 40-hour Hazardous Material & Safety training as required by 29 CFR 1910.120 for working with hazardous materials at a hazardous waste site, and an 8-hour Refresher Course or an 8-hour Supervisor Training Course, if applicable. In addition, each staff member will have completed a Hearing Conservation Program and a review of the Health & Safety Site Plan.

13.1 Training Course

Key elements of the training program include:

1. Introduction to hazardous waste site work
 - Legal considerations
 - Overview of work duties
 - 1910.120 Regulation
2. Working with hazardous materials
 - Physical/chemical properties
 - Toxicity
 - Hazards
 - Reference books
 - Sampling techniques
 - Handling, packaging, labeling
 - MSDS
 - Fire Extinguishers
3. Survey instruments
 - General monitoring equipment
 - Combustible gas indicator
 - Toxic gas indicator

- Organic vapor analyzers
- Specific survey instruments
- Oxygen meters
- Colorimetric tubes

4. Respiratory protection

- Respiratory hazards
- Respirators and their selection
- Air-purifying respirators
- Air-supplying respirators (Self Contained Breathing Apparatus: SCBA)
- Fit-testing of respirators

5. Protective clothing

- Chemical resistance
- Material selection
- Types of clothing
- Donning and doffing

6. Medical Surveillance Program & Record Keeping

7. Safety Planning, Principles & Work Practices

8. Engineering Controls

- Various types of control methods

9. Site entrance and decontamination

- General precautions
- Personal hygiene
- Operations
- Emergency medical care
- Weather conditions
- Air monitoring
- Levels of protection:
 - Level A
 - Level B

Level C

Level D

10. Drum Handling & Sampling Techniques
 - Regulations & manifesting
 - Opening drums & containers
 - Material for handling electrical equipment
 - Shock sensitive waste
 - Laboratory waste packs
 - Shipping and transport
11. Site work zones
 - Exclusion zone
 - Contamination reduction zone
 - Support area
12. Decontamination
 - Extent required
 - Equipment/solutions
 - Decontamination during medical emergencies
 - Equipment decontamination
13. Training Introduction to Sampling & Chain-of-Custody
 - Sampling procedures
 - Sampling equipment and methods
 - Documentation/Chain-of-Custody
 - Packaging, marketing, labeling & shipping
14. Emergency Response and Area Location Requirements
 - General
 - Site Emergency procedures
 - Off-site emergency procedures
 - HazMat Teams
 - Determination of Hazardous Site Logistics
 - Community Relations

Verification of the required minimum three days of actual field experience under the direct supervision of a trained, experienced supervisor will be conducted by ERM-Midwest. Workers who may be exposed to unique or special hazards will be provided with additional training as needed.

13.2 Refresher Courses

An 8-hour refresher training course will be attended annually by individuals who have completed the 40-hour training course.

The training curriculum consists of the following:

1. Revisions in OSHA 1910.120.
2. Review of Personal Protection Equipment and Medical Surveillance.
3. Respiratory Protection
4. Site Assessment
5. Health & Safety Guidelines
6. Decontamination and QA/QC Updates

13.3 Supervisor Training Course

All individuals who will act in a supervisory role on-site will have received the required additional eight hours of training for supervisors as stated in 29 CFR 1910.120.

The training curriculum consists of the following:

1. Overview of Hazardous Waste Operation and Response Regulations (OSHA 1910.120)
2. Development of Site Specific Health and Safety Plans
3. Criteria for selection of Personal Protective Equipment and Medical Surveillance Program
4. Site Security/Risk Management/Assessment
5. Medical and Employee Training Record Keeping
6. Management of Hazardous Waste Site Logistics
7. Health and Safety Guidelines for the Supervisor

13.4 Hearing Conservation

Training as deemed necessary by OSHA 1910.95 for Noise Exposure consists of the following:

1. The effects of noise on hearing.
2. The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types of protectors. Also, instructions on their selection, fitting, and use.
3. The purpose of audiometric testing, and an explanation of the test procedures.
4. Employer/employee responsibilities for record keeping.

13.5 Health and Safety Site Plan

All individuals will be taught the location and criteria for health and safety precautions at the Salem Site before actual work activities begin.

Health and Safety Plan Appendix A:
The Health Effects and the Response
to Exposure to Site Specific Compounds

Submitted by

Ruetgers-Nease
Chemical Company, Inc.
201 Struble Rd.
State College, Pennsylvania 16801

**APPENDIX A: SYMPTOMS OF OVER EXPOSURE
AND FIRST AID TREATMENT
FOR POSSIBLE HAZARDOUS:**

Volatile Organic Compounds

Non-Volatile Organic Compounds

Symptoms of Over Exposure and First
Aid Treatment for Possible Hazardous

Volatile Organic Compounds

COMPOUND - 1.1 Dichloroethene (Syn: 1,1-Dichloroethylene,
acetylene dichloride)

Exposure Route - Inhalation, ingestion, absorption,
consumption

Symptoms - Acute: Depression, skin irritation, drowsiness,
unconsciousness, liver and kidney damage,
Chronic: Headache, mental confusion and fatigue,
can cause lung edema.

First Aid - Eyes: Irrigate eyes immediately
Skin: Wash with soap promptly
Breath: Artificial respirator and fresh air
Swallow: Seek medical attention immediately

Target Organ - Skin, liver, kidney

COMPOUND - 1.2 Dichloroethene

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Irritant eyes, respiratory system,
depressant.
Chronic: Respiratory, neurological disorders

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap promptly
Breath: Artificial respirator and fresh air
Swallow: Seek medical attention immediately

COMPOUND - Chloroform (Syn: trichloromethane)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Dizziness, mental dullness, nausea,
headache, fatigue, anesthesia,
hepatomegaly, eye, skin irritant
Chronic: Neurotoxic effects, cardiac, liver,
kidney damage. Group B2 suspected
carcinogen

Note: Individuals who consume alcohol seem to be affected
sooner and more severely from chloroform exposure.

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap promptly
Breath: Artificial respirator and fresh air
Swallow: Seek medical attention immediately

Target Organ - Liver, kidney, heart, eyes, skin, Central Nervous System (CNS)*, lungs*

* Exposures should be minimized due to the structural similarity to the carcinogenic chloroethanes.

COMPOUND - 1.1.1 Trichloroethane (Syn: Methyl Chloroform)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute:	Headache, lassitude, depression, irritated eyes, tightness of breath, dermatitis.
Chronic:	Mild conjunctivitis, incoordination increased reaction time, unconsciousness, death. Cardiac arrhythmias, may cause affects on blood pressure. Congenital birth defects and spontaneous abortions.

First Aid - Eyes:	Irrigate immediately
Skin:	Wash with soap promptly
Breath:	Artificial respirator, fresh air
Swallow:	Seek medical attention immediately

Target Organ - Reproduction, liver, kidney, respiratory, cardiac, & CNS

COMPOUND - 1.2 Dichloropropane (Syn: Propylene Dichloride)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute:	Dermatitis, irritation of eyes, tightness of breath.
Chronic:	CNS narcosis, liver and kidney damage

First Aid - Eyes: Irrigate immediately
Skin: Wash surface
Breath: Fresh air, artificial respirator
Swallow: Seek medical attention immediately

Target Organ - CNS, liver, kidney, skin, eyes, respiratory system

COMPOUND - 1,3 Dichloropropene (Syn: 1,3-Dichloropropylene)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Respiratory and eye irritant, headache, nausea, dermatitis.
Chronic: Liver and kidney damage. Suspect carcinogen and mutagen

First Aid - Eyes: Irrigate immediately
Skin: Wash surface
Breath: Fresh air, artificial respirator
Swallow: Seek medical attention immediately

Target Organ - Suspected carcinogen and mutagen causes liver and kidney damage.

COMPOUND - Trichloroethene (Syn: Trichloroethylene, ethylene-trichloride, tridene)

Exposure Route - Ingestion, inhalation, absorption

Symptoms - Acute: Nausea, vomit, abdomen pain, tremors enlargement and tenderness of liver, headache, vertigo and visual disturbances.
Chronic: Dermatitis, liver kidney, paresthesias, cancer, tumors, and CNS depressant.

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap and water promptly
Breath: Artificial respirator, fresh air
Swallow: Seek medical attention immediately

Target Organ - CNS, liver, kidney, gastrointestinal, skin, respiratory system

COMPOUND - Benzene

Exposure Route - Ingestion, inhalation, absorption

Symptoms - Acute: Irritant to skin, nose, eyes, and upper respiratory tract. Pulmonary edema and hemorrhage. Erythema, vesiculation and dermatitis. Headache, nausea, giddiness.

Chronic: Leukemia, bone marrow depressive, abdominal pain, chromosomal aberrations, bronchopneumonia, leucopenia, hemato-lympho reticular neoplasies (leukemias) and mammary carcinomas, known human carcinogen

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap and water promptly
Breath: Fresh air and artificial respirator
Swallow: Seek medical attention immediately

Target Organ -Blood Mutagen, CNS, skin, bone marrow, eyes, respiratory system

COMPOUND - 1,1,2,2- Tetrachloroethane (Syn: Acetylene Tetrachloride)

Exposure Route - Ingestion, inhalation

Symptoms - Acute: Nausea, vomit, abdominal pain, tremore fingers, jaundice, enlargement and tenderness of liver.
Chronic: Dermatitis, liver, kidney, paresthesias and CNS.

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap and water promptly
Breath: Artificial respirator and fresh air
Swallow: Seek medical attention immediately

Target Organ -CNS, liver, kidney

COMPOUND - Tetrachloroethene (Syn: Tetrachlorethylene, Perchloroethylene)

Exposure Route - Inhalation, ingestion, absorption

Symptoms - Acute: Irritates eyes, skin, nose, and throat, nausea, flush face-neck, vertigo, dizziness, incoordination, headache, increased perspiration, staggers gait, slow mental ability.
Chronic: Cardiac arrhythmias and renal injury, kidney, CNS, upper respiratory disease, depressive, suspected carcinogen

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap and water promptly
Breath: Artificial respirator, fresh air
Swallow: Seek medical attention immediately

Target Organ - Liver, kidney, eyes, upper respiratory system, CNS

COMPOUND - Toluene (Syn: Phenyl methane, methyl benzene)

Exposure Route - Inhalation, ingestion, absorption

Symptoms - Acute: Fatigue, weakness, confusion, dizziness, headache, dilated pupils, nervous, dermatitis, and insomnia
Chronic: CNS, kidneys, and skin and neurological disorders

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap and water promptly
Breath: Artificial respirator, fresh air
Swallow: Seek medical attention immediately

Target Organ - CNS, liver, kidneys, skin

COMPOUND - Chlorobenzene (Syn: Monochlorobenzene; chlorobenzyl, phenol chloride, MCB)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Can cause somnolence, loss of consciousness, twitchings of extremities, cyanosis, deep rapid respiratory, burgundy red urine, and small irregular pulse. Irritant to eyes, nose, drowsiness incoordination and skin and conjunctivitis.
Chronic: Kidney, liver, respiratory, skin

burns, damage, eyes, nuerological disorders/damages.

First Aid - Eyes: Irrigate immediately
Skin: wash with soap and water promptly
Breath: artificial respirator, fresh air
Swallow: Seek medical attention immediately

Target Organ - Respiratory system, eyes, skin, CNS, liver

COMPOUND - Ethylbenzene (Syn: Phenylethane, Ethylbenzol)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Irritant and sensitive eyes, nose, throat, and skin dermatitis, upper respiratory tract, nose mouth, narcotic, and coma
Chronic: Upper respiratory disease with allergic reactions

First Aid - Eyes: Irrigate immediately
Skin: Water wash promptly
Breath: Artificial respirator
Swallow: Seek medical attention immediately

Target Organ - Eyes, immune system, upper respiratory system, skin, CNS

COMPOUND - o, m, p-xylene (Syn: 1,2 Dimethyl-benzene, 1,3 Dimethyl-benzene, 1,4 Dimethyl-benzene)

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Dizziness, excitement, drowsiness, incoordination, staggering gait, irritation to eyes, nose, throat, corneal vacuolization, anorexia, nausea, vomit, abdominal pain and pulmonary edema.
Chronic: Liver, kidney, lung disfunctions, neurotoxic effects.

First Air - Eyes: Irrigate immediately
Skin: Water wash promptly
Breath: Artificial respirator
Swallow: Seek medical attention immediately

Target Organ - CNS, eyes, gastrointestinal tract, blood liver, kidneys, skin, respiratory

COMPOUND - o. m. -Dichlorobenzene

Exposure Route - Inhalation, absorption, ingestion

Symptoms - Acute: Irritant to nose, eyes, conjuction
and mucus membranes of upper
respiratory tract.

Chronic: Liver, kidney and lung damage and
skin blistering, drowsiness,
incoordination, unconsciousness
experimental carcinogen.

First Aid - Eyes: Irrigate immediately
Skin: Wash with soap and water promptly
Breath: Artificial respirator
Swallow: Seek medical attention immediately

Target Organ - Liver, kidney, skin, eyes, respiratory system

COMPOUND - p Dichlorobenzene (1,4 dichlorobenzene)

Exposure Route - Inhalation, ingestion, absorption

Symptoms - Acute: Headache, eye irritant, swelling
periorbital, profuse rhinitis,
anorexia, nausea, vomit, low weight,
jaundice, and circulation problems
Chronic: Experimental Carcinogen and Mutagen,
liver damage

First Aid - Eyes: Irrigate immediately
Skin: Soap wash
Breath: Artificial respirator
Swallow: Seek medical attention immediately

Target Organ - Liver, skin, bladder, lungs, GI tract

NON-VOLATILE ORGANIC COMPOUNDS:

COMPOUND - Methoxychlor (Syn: 2,2-bis(p-methoxy-phenyl,
1,1,1 trichloroethane)

Exposure Route - Inhalation, ingestion, absorption

Symptoms - Acute: Irritable, trembling, convulsions
Chronic: Kidney and liver damage

First Aid - Eyes: Irrigate immediately
Skin: Wash skin
Breath: Artificial respirator
Swallow: Seek medical attention immediately

Target Organ - unknown

COMPOUND - Mirex

Exposure Route - Inhalation, ingestion, absorption

Symptoms - Acute: Nausea, abdominal pain, vomiting
Chronic: CNS depression, reproductive effects,
weight loss, anorexia

First Aid - Eyes: Irrigate with water
Skin: Wash with soap and water promptly
Breath: Fresh air, artificial respirator
Swallow: Seek medical attention immediately

Target Organ - Reproductive System

COMPOUND - 3,4 Dichloronitrobenzene

Exposure Route - Inhalation, Ingestion, Absorption

Symptoms - Acute: Headache, nausea, depression,
tightness of chest
Chronic: No information available

First Aid - Eyes: Irrigate with water
Skin: Wash with soap and water promptly
Breath: Fresh air, artificial respirator
Swallow: Seek medical attention immediately

Target Organ - Blood, kidneys, liver, bone marrow and nervous system

COMPOUND - Diphenyl Sulfone (Syn: Phenyl Sulfone, Benzene,
1,1'-sulfonyl bis-(9cl)

Exposure Route - Inhalation, ingestion, absorption

Symptoms - Acute: No information available*
Chronic: No information available*

First Aid - Eyes:	Irrigate with water
Skin:	Wash with soap and water promptly
Breath:	Fresh air, artificial respirator
Swallow:	Seek medical attention immediately

Target Organ - Skin, liver, kidney and CNS

*** EPA Chemical #399500 - out of date pesticide**

CAS#127-63-9

**Tox Net, RTECS, IRIS, and Hazardous Substance Data Bases
searched**

Health and Safety Plan Appendix B: Health and Safety Forms

Submitted by

Ruetgers-Nease
Chemical Company, Inc.
201 Struble Rd.
State College, Pennsylvania 16801

APPENDIX B: FIELD DOCUMENTATION

Plan Acceptance Form

Health Certification Form

Accident Report Form

Accident Investigation Form (by SSO)

Respiratory Issuance Form

Hearing Protection Issuance Form

Sampling Equipment Calibration Form

Sampling Data Form

Air Monitoring Form

HEALTH AND SAFETY PLAN ACCEPTANCE FORM

INSTRUCTION: This form is to be completed by each person to work on the Salem Site Remedial Investigation/Feasibility Study and returned to the Health and Safety Officer.

I represent that I have read and understand the contents of the Salem Site Health and Safety Plan and agree to perform my work in accordance with it.

Signed

Print Name

Company

Date

HEALTH CERTIFICATION FORM
RUETGERS-NEASE SALEM SITE RI/FS

The Salem Site Remedial Investigation/Feasibility Study may expose the field personnel to hazardous compounds during the project.

TO: Health and Safety Officer

ERM-Midwest, Inc.

450 W. Wilson Bridge Road

Worthington, OH 43085

(614) 433-7900

FROM:

From my examination I do not see any reason to preclude from performance of his/her normal work activities, including those that may require the use of protective clothing and respiratory equipment during this project.

Exceptions:

(Examining Physician)

(Date)

SALEM SITE
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
ACCIDENT REPORT FORM

SUPERVISOR'S REPORT OF ACCIDENT

DO NOT USE FOR MOTOR VEHICLE
OR AIRCRAFT ACCIDENTS

TO

FROM

TELEPHONE(include area code)

NAME OF INJURED OR ILL EMPLOYEE

DATE OF ACCIDENT

TIME OF ACCIDENT

EXACT LOCATION OF ACCIDENT

NARRATIVE DESCRIPTION OF ACCIDENT

NATURE OF ILLNESS OR INJURY AND PART OF BODY INVOLVED

LOST TIME
YES NO

PROBABLE DISABILITY (Circle One)

FATAL	LOST WORK DAY WITH DAYS AWAY FROM WORK	LOST WORK DAY WITH DAYS OF RESTRICTED WORK	NO LOST WORK DAY	FIRST AID ONLY
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CORRECTIVE ACTION WHICH REMAINS TO BE TAKEN (By whom and by when)

List of Witnesses and their statements

NAME OF SUPERVISOR

TITLE

SIGNATURE

DATE

Identify Standard violated (law, procedure,
etc.): _____

What evidence was taken (describe what and where
taken): _____

What corrective action requested (how requested and to whom, in addition to
description): _____

Was first report of injury made: _____ by whom: _____

If incident investigated by others, identify
who: _____

Describe what action necessary to prevent
recurrence: _____

Check the following:

Witness statements attached _____ Evidence attached _____ Supplement attached _____

If investigation information supplied to others outside of Safety Operations,
identify whom and
why: _____

Signature of Investigator

FOLLOW-UP NARRATIVE:

Signature/Date _____

ACCIDENT INVESTIGATION INFORMATION

· RUETGERS-NEASE SALEM SITE RI/FS

To be completed by Site Health and Safety Manager

Investigator: _____ Date: _____ Time: _____

Date and Location of Accident _____

Reported by: _____ Date/Time: _____

DESCRIPTION: (Narrate what happened in detail - use supplement sheets, if necessary)

Identify to Whom or What:

Supervisor of Area where occurrence took place: _____

Supervisor of employee(s) or object(s)

involved: _____

Where were supervisors (each, if different) when incident occurred: _____

List witnesses (name, badge, phone, mail point, supervisor) and relate where each was and what each was doing at the time of occurrence:

Describe cause of incident (identify if suspected or apparent): _____

RESPIRATOR ISSUANCE FORM
RUETGERS-NEASE SALEM SITE RI/FS

I. Employee/User

Name: _____ Date: _____

S.S. #: _____

Address: _____ Phone: _____

Employer: _____

Supervisor: _____

Sex: _____ Race: _____ DOB: _____

Type of Work Being Done: _____

Type of Chemical Exposure: _____

II. Medical/Occupational Health

1. Pulmonary function test approved. Yes ____ No ____

Date Tested: _____ By: _____

2. Fit Test. Yes ____ No ____ Type performed: _____

III. Industrial Hygiene

1. Received respiratory training as deemed by OSHA Std.
1910.134.

Date: _____ By: _____

2. Any restrictions or special precautions. (Ex. beard,
long side burns, etc.)

3. Type of respirator issued and by whom: _____

HEARING PROTECTION ISSUANCE FORM
RUETGERS-NEASE SALEM SITE RI/FS

I. Employee/User

Name: _____ Date: _____

S.S. #: _____

Address: _____ Phone: _____

Employer: _____

Address: _____

Supervisor: _____

Sex: _____ Race: _____ DOB: _____

II. Medical/Occupational Health

1. Audiometric exam results/restrictions. _____

2. Type of protection employee/user can use. _____

3. Additional comments: _____

III. Industrial Hygiene

1. Has Industrial Hygiene performed any tests (noise) for employee/user under hearing conservation program at any location.

a. Yes ____ No ____

b. Where: _____ Date: _____

2. Type of protection issued: _____

3. Employee/User trained as deemed by OSHA 1910.95 Std.

a. Yes ____ No ____

b. By Whom: _____ Date: _____

SAMPLING EQUIPMENT CALIBRATION FORM
KUETZERS-NEASE SALEM SILEX RIVS

[illegible]

1. ESTABLISHMENT

INSPECTION NO.
2 CONSULTANT NO.

2. REPORTING

IN PERFORMING SAMPLING

5. SAMPLING DATE

6. WEATHER CONDITIONS

TEMP

NUM.

414C

EMPLOYEE NAME

2. JOB TITLE

9. AREA OF EXPENSE

ADDRESS

11. CITY

12. PHONE NUMBER	
------------------	--

PIPE TYPE & EFFECTIVENESS

14. PHOTO

2

20LL VC
2222 VC

JOB DESCRIPTION, OPERATION, WORK LOCATIONS, ENG. CONTROLS, VENTILATION

CONT'D

PUMP NO.

SAMPLING DATA

DATE SUBMITTED TO LAB

SAMPLE TYPE/MEDIA

SAMPLE NUMBER

TIME ON

ME OFF

TAL TIME (MIN.)

FLOW RATE ☒ 1/min ☐ 0.5/min

VOLUME ILITERASI

NET SAMPLE WGT (MG.)

LAB SAMPLE NO.

[illegible]

INTERFERENCES AND I.M. COMMENTS TO LAB

27. SUPPORTING SAMPLES

2 BLANKS

B. BULKS.

2 OTHER

ANALYST'S COMMENTS/ADDITIONAL ANALYSIS

2162

CB

GENERAL INFORMATION

Location Where Background Level Was Obtained: _____

ppm

AUG 30 1989

145 N. High Street
Post Office Box 118
Columbus, Ohio 43266-0118
Telephone (614) 466-3543



RICHARD F. DELESTE
Governor

MINUTES OF THE MEETING OF THE ODH-IRB
FOR THE
PROTECTION OF HUMAN RESEARCH SUBJECTS
August 25, 1989

Members Present:

Kenneth Bupp	Kim Mortensen
Timothy F. Champney	Kathleen Smith
George Horst	

Members Absent:

Karen Evans
Karen Lane
Herbert Mirels

Others Present:

Russel Roeder
George Shadle
Deborah Gray

The meeting was opened and conducted by Dr. Horst, chairman. Deborah Gray presented the information concerning the proposed study, "Assessment of exposure to Mirex Related to the Ruetgers - Nease Superfund Site in Columbiana County, Ohio."

There were only 4 "eligible" members present due to the fact that Kim Mortensen is named Co Investigator. Since a majority of the committee were not present, the review will be considered an expedited review.

The discussion of those present concluded that the study should be approved as presented for the following reasons:

1. The study is voluntary and by invitation only.
2. There is minimal risk. Only one 15 ml. specimen is required.
3. The study is in adults (18yrs. or older)
4. A well designed consent form is being used.
5. All results and data are guarded as to confidentiality with study I.D. numbers used and any results will be in the form of composite data.
6. Post-test counseling and information is provided.

The meeting was adjourned by the chairman.

THE OHIO DEPARTMENT OF HEALTH
HUMAN SUBJECTS INSTITUTIONAL
REVIEW BOARD

Protocol No. 1984 - 04

Original Review X

Continuing Review _____

ACTION OF THE REVIEW BOARD
(Certification)

With regard to the employment of human subjects in the proposed research entitled:
Assessment of Exposure to Mirex Related to the Ruetkus - Nease Superfund Site
in Columbiana County, Ohio

ODC or HHS Federal Project Number (if any): N/A

Principal Investigator: Deborah L. Gray

Agency: Ohio Department of Health

Bureau: Preventive Medicine Division: Epidemiology & Toxicology

The Institutional Review Board has taken the following action:

☒ Approved ☒ Expedited Review ☐ Waiver of Written Consent
☐ Disapproved ☐ Full Board Review ☐ Exempt

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the ODH, signed consent forms are to be retained by the Division Chief for the required retention period. This application has been approved for the period of one year. No procedural changes may be made without prior review and approval. You are reminded that the identity of the research participants must be kept confidential.

Date: 3/25/89

Signed: _____

George W. Horat
Chairperson

cc: Investigator
Division Chief
Bureau Chief

Participants Consent: I have been fully informed of the above-described procedure with its possible benefits and risks. I give permission for my/my child's participation in this study. I know that Dr. Lambert or his associates will be available to answer any questions I may have. If, at any time, I feel my questions have not been adequately answered, I may request to speak with a member of the Loyola Medical Center Institutional Review Board. I understand that I am free to withdraw this consent and discontinue participation in this project at any time without prejudice to my/my child's medical care or follow-up studies with the Department of Public Health. If I wish a copy of this consent document, one will be provided for me.

I understand that biomedical or behavioral research such as that in which I have agreed to participate, by its nature, involves risk of injury. In the event of physical injury resulting from these research procedures, emergency medical treatment will be provided at no cost. No additional free medical treatment or compensation will be provided except as required by Illinois Law.

In the event I believe that I have suffered any physical injury as the result of participation in the research program, I may contact:

Kenneth Micetich, M.D.
Vice Chairman, Institutional Review Board for the
Protection of Human Subjects at the Loyola
University Medical Center
Telephone (312) 531-3321

Physician Review: I have fully explained to

(Name: _____) the nature and purpose of the above-described procedure and the risks that are involved in its performance. I have answered and will answer all questions to the best of my ability.

(Signature: Principal Investigator)

I agree to allow my name and medical records to be available to other authorized physicians and researchers for the purpose of evaluating the results of this study. I consent to the publication of any data which may result from these investigations for the purpose of advancing medical knowledge.

providing my name or any other identifying information (initials, social security number, etc.) is not used in conjunction with such publication. All precautions to maintain confidentiality of the medical records will be taken.

Investigator's Signature

Participant's Signature

Witness

Parent's Signature for
Child Subject

Date: _____

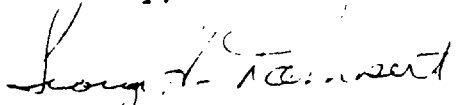
- the results of the above study will be reported in the literature by Dr. Lambert and Schoeller, Dr. Mortensen and Deborah Gray, Dr. Needham, and others as indicated.
- results of the study MAY indicate a larger study is needed and, if so indicated, a formal grant will be written up by the Health Department to include all involved parties as in the preliminary study.

I trust this covers all that is necessary, if not I can FAX any additional information that you need.

The dates at the end of October are still good for me, but if you want to push them back into the end of that week so we can miss Halloween that would be fine if not better for me.

Thank you for the information you sent, that was most helpful.
I look forward to carrying out the study and seeing the results!

Sincerely,



George H. Lambert, MD
Associate Professor of Pediatrics
Member Graduate Molecular Biology Faculty

cc:Dr. Hurley
enclosure

CONSENT TO PARTICIPATE IN RESEARCH STUDY

Title: The Effects of Mirex on Hepatic Function as Measured by the Caffeine Breath Test

Investigators: Dr. G. H. Lambert and Dr. Mortensen

Institutions: Loyola University, Chicago and the Ohio Department of Health,

Purpose: To determine the effects of Mirex on liver function as tested by breath analysis.

Nature of Procedure:

A caffeine breath test will be performed. In this test a specially prepared caffeine drink made with heavy, nonradioactive carbon, will be given to myself. The amount of caffeine given will be similar to the amount of caffeine in 1-2 cups of coffee or two or three glasses of cola.

At 30-minute intervals after drinking the caffeine, I will exhale once into a plastic bag. The test will take two hours.

Risks and Discomforts: Since heavy carbon is nonradioactive and heavy carbon makes up 1% of all the carbon in my body, there is no obvious risk to me from the heavy carbon. Caffeine may cause a slight transient increase in the blood pressure, heart rate, and breathing rate. Even though the best and most recent data state this is not true, a subject who is possibly pregnant should not take part in the study.

The study will take 2-1/2 hours to do in the clinic.

Pregnancy Clause: If you are pregnant, you should not take part in the study.

Benefits: I understand that almost everyone in the world is exposed to one the these environmental chemicals and this study is designed to understand if these chemicals can increase liver function.

Alternatives: You can elect not to participate in this study.

Financial Risks: There is no cost to you decide to participate in this study.